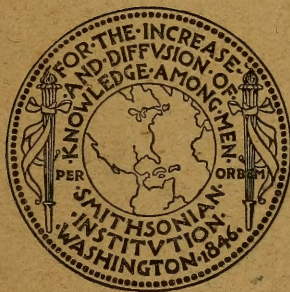


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PORT OF THE SECRETARY
OF THE SMITHSONIAN
INSTITUTION

FOR THE YEAR ENDING JUNE 30

1913



(Publication 2249)

WASHINGTON
GOVERNMENT PRINTING OFFICE
1913

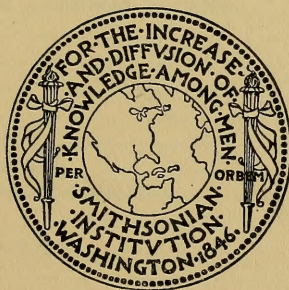
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REPORT OF THE SECRETARY OF THE SMITHSONIAN INSTITUTION

FOR THE YEAR ENDING JUNE 30

1913



(Publication 2249)

WASHINGTON
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1913

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REPORT OF THE SECRETARY OF THE SMITHSONIAN INSTITUTION

CHARLES D. WALCOTT

FOR THE YEAR ENDING JUNE 30, 1913.

To the Board of Regents of the Smithsonian Institution:

GENTLEMEN: I have the honor to submit herewith a report on the operations of the Smithsonian Institution and its branches during the fiscal year ending June 30, 1913, including work placed by Congress under the direction of the Board of Regents in the United States National Museum, the Bureau of American Ethnology, the International Exchanges, the National Zoological Park, the Astrophysical Observatory, and the United States Bureau of the International Catalogue of Scientific Literature. There is also included an outline of work proposed in the Langley Aerodynamical Laboratory, the establishment of which has been authorized by the Board of Regents under a grant from the Hodgkins fund of the Institution.

The general report reviews the affairs of the Institution proper and briefly summarizes the operations of its several branches, while the appendices contain detailed reports by the assistant secretaries and others directly in charge of various activities. The reports on operations of the National Museum and the Bureau of American Ethnology will also be published as independent volumes.

THE SMITHSONIAN INSTITUTION.

THE ESTABLISHMENT.

The Smithsonian Institution was created an establishment by act of Congress approved August 10, 1846. Its statutory members are the President of the United States, the Vice President, the Chief Justice, and the heads of the executive departments.

THE BOARD OF REGENTS.

The Board of Regents consists of the Vice President and the Chief Justice of the United States as ex officio members, three Members of the Senate, three Members of the House of Representatives, and six citizens, "two of whom shall be resident in the city

of Washington, and the other four shall be inhabitants of some State, but no two of them of the same State."

In regard to the personnel of the board it becomes my sad duty to record the death on October 30, 1912, of its Chancellor, James Schoolcraft Sherman, Vice President of the United States. Resolutions in memory of Chancellor Sherman were adopted by the Regents at their annual meeting on December 12, when the Hon. Edward D. White, Chief Justice of the United States, was elected Chancellor of the Institution.

Dr. Andrew D. White was reappointed as Regent to serve until June 26, 1918; the Hon. Charles W. Fairbanks to serve until July 3, 1918; and Judge Gray to serve until February 7, 1919. Senator Bacon was reappointed a Regent, and Senator William J. Stone was appointed to succeed the Hon. Shelby M. Cullom, whose term as United States Senator expired in March, 1913. The Hon. Thomas R. Marshall, Vice President of the United States, became a Regent on March 4, 1913.

The roll of Regents at the close of the fiscal year was as follows: Edward D. White, Chief Justice of the United States, Chancellor; Thomas R. Marshall, Vice President of the United States; Henry Cabot Lodge, Member of the Senate; Augustus O. Bacon, Member of the Senate; William J. Stone, Member of the Senate; John Dalzell, Member of the House of Representatives; Scott Ferris, Member of the House of Representatives; Irvin S. Pepper, Member of the House of Representatives; Andrew D. White, citizen of New York; Alexander Graham Bell, citizen of Washington, D. C.; George Gray, citizen of Delaware; Charles F. Choate, jr., citizen of Massachusetts; John B. Henderson, jr., citizen of Washington, D. C.; and Charles W. Fairbanks, citizen of Indiana.

Regular meetings of the Board of Regents were held on December 12, 1912, and February 13, 1913, and a special meeting on May 1, 1913. The minutes of these meetings have been printed as usual for the use of the Regents, while such important matters acted upon as are of public interest are reviewed under appropriate heads in the present report of the secretary. The annual financial report of the Executive Committee has also been issued in the usual form, and a detailed statement of disbursements from Government appropriations under the direction of the Institution for the maintenance of the National Museum, the National Zoological Park, and other branches will be submitted by the secretary to Congress in compliance with the law.

GENERAL CONSIDERATIONS.

The activities of the Smithsonian Institution under its plan of organization cover practically the entire field of the natural and physical sciences, as well as anthropological and archeological re-

searches. The Institution was founded for the increase and diffusion of knowledge. It is an Institution of record, research, and education, and also of cooperation. It offers facilities for the advancement of human knowledge through original research and investigation in every field and educates the people through the publication of the results of such researches. There is reciprocal cooperation between the Smithsonian Institution and the several departments of the United States Government and learned societies in this country and abroad in carrying forward important explorations and lines of investigation.

Some of the scientific studies originating with the Smithsonian Institution in this country have since developed into distinct and important bureaus and departments of the Government. The influence of the Institution is world-wide; through its international exchange service alone it is in correspondence with more than 60,000 individuals and learned societies in the United States and practically in every land on the globe. During its entire existence there has been an unbroken record of friendly intercourse with every agency devoted to the encouragement of learning. As was said in 1896, by the late Dr. Daniel Coit Gilman, "Without any patronage, without the power to bestow much pecuniary assistance, * * * the Smithsonian has been, and is, the great auxiliary of science and education throughout the length and breadth of the land."

The extent of the activities of the Institution is limited only by the amount of the funds available. During recent years its private income has been supplemented on several occasions by friends of the Institution who have generously provided the means for carrying on certain explorations and lines of research, but opportunities for further important work constantly arise which must be declined or temporarily held in abeyance. Some of the projects proposed are such as could not properly be carried on through Government appropriation, but which the Smithsonian Institution could readily undertake were the means available.

Research Corporation.—The work of the Research Corporation, organized primarily for handling the Cottrell patents offered to the Institution for the benefit of research, has been progressing steadily during the year. As explained in detail in my last report, this corporation was organized February 8, 1912, under the laws of the State of New York as a means of furthering scientific and technical research. It objects as stated in its prospectus are:

First, to acquire inventions and patents and to make them more available in the arts and industries, while using them as a source of income, and, second, to apply all profits derived from such use to the advancement of technical and scientific investigation and experimentation through the agency of the Smithsonian Institution and such other scientific and educational institutions and societies as may be selected by the directors. For these purposes the corporation has been capitalized at \$20,000, divided into 200 shares, but the charter

provides that no dividends shall be paid and that the entire net profits shall be devoted to research, all the stock being held under a stockholders' agreement, which recites that the corporation has been organized for the purpose of aiding and encouraging technical and scientific research, and not for personal or individual profit.

At the present time many discoveries are constantly being made, which undoubtedly possess a greater or less potential value, but which are literally being allowed to go to waste for lack of thorough development. This is due, in some cases, to the fact that the inventors are men in the service of the Government or in the universities or technical schools, who are retarded either by official positions, lack of means, or reluctance to engage in commercial enterprises, and in other cases to the fact that a discovery made incidentally in the laboratory of a manufacturing corporation does not lend itself to the particular purpose of such corporation. True conservation demands that such by-products as these shall be developed and utilized to the fullest extent of which they are capable. The Research Corporation aims to supply this demand and, through the cooperation of the Smithsonian Institution and the universities, to carry forward the work of investigation already begun by others upon lines which promise important results and to perfect such inventions as may prove to possess commercial value, thus bringing scientific institutions into closer relations with industrial activities and furthering the improvements of industrial processes.

The establishment of the Research Corporation was rendered immediately possible by the acquisition, through the gift of Dr. F. G. Cottrell, of the United States Bureau of Mines, and his associates, of a valuable set of patents relating to the precipitation of dust, smoke, and chemical fumes by the use of electrical currents. These devices are in operation in several States, and are fully described in an article in *Industrial and Engineering Chemistry*, for August, 1911.

A number of other patents in various fields of industry have been offered by officers of the Government and scientific institutions, as well as by manufacturing corporations holding patents not available for their own purposes, and undoubtedly there are many others, both in this country and abroad, who will be glad to have their inventions utilized for the benefit of scientific research. The Smithsonian Institution is interested in the management of this corporation through the membership of the secretary in its board of directors, which is composed of business and professional men, many of whom have had experience in large industrial and mining enterprises.

The George W. Poore bequest.—By the terms of the will of the late George W. Poore, of Lowell, Mass., who died December 17, 1910, the Smithsonian Institution becomes his residuary legatee. As mentioned in my 1910 report, the estate, estimated at about \$40,000, is bequeathed under the condition that the income of this sum should be added to the principal until a total of \$250,000 should have been reached, and that then the income only should be used for the purposes for which the Institution was created. The estate is still in process of settlement by the executors.

As a reason for making this bequest to the Smithsonian Institution, Mr. Poore in his will says: "I make this gift not so much because of its amount as because I hope it will prove an example for other Americans to follow, by supporting and encouraging so wise and beneficent an institution as I believe the Smithsonian Institution to be, and yet it has been neglected and overlooked by American citizens."

The Kahn Foundation.—The Smithsonian Institution is closely allied with a number of organizations and movements of importance to the public through the membership of the secretary in various boards of trustees. Some of these are mentioned elsewhere in this report and among others are the Carnegie Institution of Washington, with whose administration the secretary has been connected since its establishment, and "The Kahn Foundation for the Foreign Travel of American Teachers." The last-named organization was founded in 1911 through a deed of gift and trust between Albert Kahn, of Paris, France, of the first part, and Edward D. Adams, Nicholas Murray Butler, Henry Fairfield Osborn, of New York; Charles W. Eliot, of Cambridge; and Charles D. Walcott, of Washington, of the second part. The founder had heretofore established certain trust funds in France, Germany, Japan, England, and other countries for the purpose of defraying the expenses of teachers and supplying them with what he termed "bourses de voyage" so as to enable them to travel, observe, and study in foreign countries. He believes "that the cause of civilization may be greatly encouraged and promoted by travel on the part of teachers, scholars, and investigators, and that, by the study and comparison of national manners and customs, and of political, social, religious, and economic institutions of foreign countries, they will become better qualified to teach and to take part in the instruction and education of the people of their own nation." In the selection of beneficiaries of the Kahn Foundation preference is given to professors of American colleges or universities and, as a rule, the itinerary is expected to involve an absence from America of at least a year. The limited size of the fund does not permit the granting of more than two or three fellowships each year.

FINANCES.

The permanent fund of the Institution and the sources from which it was derived are as follows:

Deposited in the Treasury of the United States.

Bequest of Smithson, 1846.....	\$515, 169. 00
Residuary legacy of Smithson, 1867.....	26, 210. 63
Deposit from savings of income, 1867.....	108, 620. 37
Bequest of James Hamilton, 1875.....	\$1, 000
Accumulated interest on Hamilton fund, 1895.....	1, 000
	<hr/>
	2, 000. 00

Bequest of Simeon Habel, 1880-----	500.00
Deposits from proceeds of sale of bonds, 1881-----	51,500.00
Gift of Thomas G. Hodgkins, 1891-----	200,000.00
Part of residuary legacy of Thomas G. Hodgkins, 1894-----	8,000.00
Deposit from savings of income, 1903-----	25,000.00
Residuary legacy of Thomas G. Hodgkins, 1907-----	7,918.69
Deposit from savings of income, 1913-----	636.94
Bequest of William Jones Rhees, 1913-----	251.95
Deposit of proceeds from sale of real estate (gift of Robert Stanton Avery), 1913 -----	9,692.42

Total amount of fund in the United States Treasury-----	955,500.00
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OTHER RESOURCES.

Registered and guaranteed bonds of the West Shore Railroad Co., part of legacy of Thomas G. Hodgkins (par value)-----	42,000.00
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Total permanent fund -----	997,500.00
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There were originally four pieces of real estate bequeathed to the Institution by the late R. S. Avery, but during the year one of these pieces and a part of another were sold and the proceeds added to the permanent fund. The real estate owned by the Institution is free from taxation and yields a nominal rental.

That part of the fund deposited in the Treasury of the United States bears interest at 6 per cent per annum, under the provisions of the act organizing the Institution and an act of Congress approved March 12, 1894. The rate of interest on the West Shore Railroad bonds is 4 per cent per annum.

The income of the Institution during the year, amounting to \$92,870.74, was derived as follows: Interest on the permanent foundation, \$58,375.12; contributions from various sources for specific purposes, \$16,575.50; and from other miscellaneous sources, \$17,920.12; all of which was deposited in the Treasury of the United States to the credit of the current account of the Institution.

With the balance of \$33,060.09 on July 1, 1912, the total resources for the fiscal year amounted to \$125,930.83. The disbursements which are given in detail in the annual report of the executive committee, amounted to \$92,289.43, leaving a balance of \$33,641.40 on deposit June 30, 1913, in the United States Treasury.

The Institution was charged by Congress with the disbursement of the following appropriations for the year ending June 30, 1913:

International exchanges -----	\$32,000
American ethnology -----	42,000
Astrophysical Observatory -----	13,000
National Museum:	
Furniture and fixtures-----	50,000
Heating and lighting-----	50,000
Preservation of collections-----	300,000
Books-----	2,000
Postage-----	500
Building repairs-----	10,000

National Zoological Park.....	100,000
Bridge over Rock Creek, National Zoological Park.....	20,000
International Catalogue of Scientific Literature.....	7,500
Total.....	627,000

In addition to the above specific amounts to be disbursed by the Institution, there was included under the general appropriation for public printing and binding an allotment of \$74,900 to cover the cost of printing and binding the annual report and other Government publications issued by the Institution, and to be disbursed by the Public Printer.

RESEARCHES AND EXPLORATIONS.

The Smithsonian Institution has continued to carry on field work in various lines throughout the world by means of small allotments from its funds. It has also accomplished a great deal in the way of exploration and research through the generosity of friends of the Institution, who have contributed funds for special work or provided opportunities for participation in explorations which they had undertaken personally or through the aid of others. Each year, however, the Institution is obliged to forego opportunities for important investigations through lack of sufficient funds.

I can here only briefly mention some of the explorations and researches in progress during the past year. Accounts of activities connected with the Astrophysical Observatory, the Bureau of American Ethnology, and the United States National Museum are given in other parts of this report by those in direct charge of those branches of the Institution.

LANGLEY AERODYNAMICAL LABORATORY.

At a meeting of the Board of Regents on May 1, 1913, the following resolutions were adopted:

Whereas the Smithsonian Institution possesses a laboratory for the study of questions relating to aerodynamics, which has been closed since the death of its director, the late Dr. S. P. Langley, formerly Secretary of the Smithsonian Institution; and

Whereas it is desirable to foster and continue, in the Institution with which he was connected, the aerodynamical researches which he inaugurated;

Resolved, That the Board of Regents of the Smithsonian Institution hereby authorizes the Secretary of the Institution, with the advice and approval of the executive committee, to reopen the Smithsonian Institution laboratory for the study of aerodynamics and take such steps as in his judgment may be necessary to provide for the organization and administration of the laboratory on a permanent basis.

That the aerodynamic laboratory of the Institution shall be known as the Langley Aerodynamical Laboratory.

That the functions of the laboratory shall be the study of the problems of aerodynamics, particularly those of aerodynamics, with such research and experimentation as may be necessary to increase the safety and effectiveness of

aerial locomotion for the purposes of commerce, national defense, and the welfare of man.

That the secretary is authorized to secure, as far as practicable, the co-operation of governmental and other agencies in the development of aerodromical research under the direction of the Smithsonian Institution.

The Regents also authorized the secretary to appoint an advisory committee; to add, as means are provided, other laboratories and agencies; to group them into a bureau organization; and to secure the cooperation with them of the Government and other agencies.

In accordance with the above general plan an advisory committee was organized at a meeting convened at the Institution on May 23, 1913. The official status, organization, agencies, resources, and facilities of this committee are set forth in a statement reprinted in the appendix to the present report.

In preparing plans for carrying forward investigations in various lines a study is being made of researches in progress in other countries, and an allotment has been made from the Hodgkins fund for the maintenance, in part, of the laboratory.

STUDIES IN CAMBRIAN GEOLOGY AND PALEONTOLOGY.

During the field season of the fiscal year 1912-13, or the spring and summer of 1913, I continued my geological work in the Canadian Rockies. A month was spent in the Robson Park district of British Columbia, and Jasper Park, Alberta, our camp being on the continental divide near Berg Lake, northwest of the Yellowhead Pass, through which the Grand Trunk Pacific and Canadian Northern Railways have been built.

Considerable collections of fossils were made at several localities, photographs were taken, and several places in the geological section studied in 1912 were examined. This was rendered necessary by reason of my having been driven out of the region by continued rain and snow storms the previous year.

From the Robson district I went to Burgess Pass, north of Field, British Columbia, and worked at the Middle Cambrian fossil quarry until late in the season. Both in the Robson district and also at Burgess Pass I was assisted by my two sons, Sidney and Stuart, who have had many years' experience in field work in the Rocky Mountains. Mr. R. D. Mesler, of the United States National Museum, spent nearly the entire field season collecting at Burgess Pass. Special effort was made to finish collecting at this famous locality, and at the close of the field season a collection of several thousand specimens weighing over two and a half tons was shipped to Washington.

GEOLOGICAL SURVEY OF PANAMA.

A plan has been formulated and some progress has been made in certain lines of field work for a geological survey of Panama, under

the joint auspices of the Isthmian Canal Commission, the United States Geological Survey, and the Smithsonian Institution, and an allotment has been made from the Institution's funds toward the expenses of such investigation. The general plan of the survey comprises a systematic study of the physiography, stratigraphy and structural geology, geologic history, geologic correlation, mineral resources (including coal, oil, and other fields), petrography and paleontology of the Canal Zone, and of as much of the adjacent areas of the Isthmian region as is feasible. In this survey an opportunity is afforded for working out in detail the succession of the geologic formations and the study of the structure, petrography, and paleontology of a Central American area such as has never before existed, and probably never will be realized again. It is possible to make and properly characterize a standard geologic section of this part of the world, one with which the more obscure exposures of adjacent areas may be compared. There is already nearly completed a section of each side of the Culebra Cut in a horizontal scale of 1:5,000, vertical scale 1:2,500; and a general section has been made from the Atlantic to the Pacific, with collections from every fossiliferous exposure seen. A basis has been practically determined for the intercorrelation of the formations across the Isthmus and for correlation with the Gulf States, also with certain formations in some of the West Indian Islands.

Upon the completion of this survey the Institution will publish a general account of the work accomplished, and later it is planned to print a detailed report of the geological data of the Isthmus and adjoining regions.

BIOLOGICAL EXPEDITIONS IN AFRICA.

Rainey African expedition.—The Paul J. Rainey expedition in British East Africa came to a successful close in February, 1912. The collections, numbering 5,750 large and small mammals, 400 birds, 2,000 reptiles, and 500 miscellaneous specimens, included a large number of new genera and species since described in the publications of the Institution and the National Museum. During this expedition Mr. Edmund Heller, of the National Museum, who had previously served as naturalist on the expedition under Col. Roosevelt, was the guest of Mr. Rainey, who provided him all the native assistants that he could use, and accorded him perfect freedom as regards choice of collecting ground. Mr. Heller was thus able to visit the exact regions from which material was most needed to supplement that procured by the previous expedition. After studying the mammals in the British Museum, Mr. Heller reports that the United States National Museum now has the finest series of East African mammals in the world. Eighty lions were secured on the expedition, which more than tripled the highest previous record for Africa.

The Childs Frick Expedition.—As mentioned in my last report, Dr. Edgar A. Mearns, United States Army, associate in zoology in the National Museum, who had served on the expedition under Col. Roosevelt, accompanied Mr. Childs Frick, of New York, on a hunting and collecting trip in the territory north of that visited by Col. Roosevelt and Mr. Rainey, covering at the same time certain parts of Abyssinia, northern British East Africa, and the country lying about Lake Rudolf. The expedition ended in September, 1912. The collections as a whole embraced plants, mammals, birds, reptiles, batrachians, fishes, mollusks, crustaceans, and other invertebrates. A part of the large collection of birds obtained by this expedition is deposited in the National Museum.

EXPLORATIONS IN BORNEO.

Abbott Borneo expedition.—Through the generosity of Dr. W. L. Abbott, who for many years was engaged in natural history and ethnological investigations in the Malay Archipelago, a fund has been provided for natural history field work in Dutch East Borneo.

Nothing has been published concerning this practically unknown region, and the National Museum had no collections from East Borneo, although there were a few from the west and south coasts of Borneo. During the past year Mr. Raven, in charge of this exploration, succeeded in securing a very interesting series of the characteristic mammals of the country, such as oranges, deer, wild pigs, squirrels and smaller rodents, and other interesting species.

Dr. Streeter's exploration in Borneo.—Mr. Daniel Denison Streeter, jr., of Brooklyn, having offered his services as a collaborator in zoology of the National Museum, sailed from New York on April 4, 1912, and returned December 24, 1912. Some of his thrilling experiences in the interior of Borneo are described in his interesting report to the Institution. He passed from Sarawak into Dutch Borneo by ascending the Rejang River and crossing the mountains on the dividing line to the Kajan River. He then ascended to the head of this river and crossed another range to the headwaters of the Mahakam River, which he descended to the Strait of Macassar. During his trip he secured some interesting collections of mammals, reptiles, and anthropological specimens, part of which have been received by the Museum, but many additional specimens were necessarily left behind in the mountains and may not be recovered.

In describing his journey Mr. Streeter writes:

Arriving at Kuching, the capital of the Kingdom of Sarawak, in north-western Borneo. I apprised the officials of my plan to cross Borneo. They helped me with every means in their power, although they told me that no man had ever yet been across Borneo, and that they did not think it possible for me to do it. * * * I crossed a bay 200 miles wide in a Chinese junk to the

mouth of the Rejang River. Here I engaged three Malays and their canoe to take me 80 miles up the river to the island of Sibü. * * * A little Malay river steamer arrived and took me 90 miles farther up the river—as far as it could go. At this head of navigation is a little native town called Kapit, and here I again took to dugout canoes, this time for good and all. * * * It took me two months to ascend this river to its headwaters. I collected specimens of reptiles and mammals, together with interesting anthropological specimens, took photographs of all kinds, studied the natives, the rivers, the weather, vegetable life in general, made notes on everything, and mapped my course as accurately as I could with the instruments in my possession. * * * I crossed the main range of mountains forming the backbone of Borneo to the headwaters of the Kajan River. I estimate the altitude of the pass through which I crossed the mountains at a little over 3,000 feet. * * * [He then proceeded] in dugout canoes down one branch of the Kajan River and up the main river for several days to the immense village of Long Nawong. This village comprises about 3,000 souls, ruled by a native rajah, who visited me and with whom I exchanged presents. Here I set out with one canoe and five head-hunters as paddlers and continued up the Kajan River. A flood arose, my canoe went to the bottom, and we had to swim for shore. I saved my rifle and my tin box of maps, papers, diaries, and notes.

Continuing on foot up the river we fell in with a party of 40 head-hunters of the Bahau Tribe and I arranged to travel with them, sending back my five Kajan paddlers. With this Bahau troupe I continued up the Kajan River to its headwaters and over another range of mountains to the headwaters of the Mahakam River. * * * After losing my collection I immediately began a second collection, and this assumed the proportions of the first as I proceeded. When within about 500 miles of the mouth of the Mahakam River I came to the first outpost of civilization, the Dutch military post of Long Iram, in charge of a Dutch captain and a company of native Javanese. Upon hearing my story the captain promised to send a military expedition up into the interior, where the Dutch had never been before, and try and secure the outfit which I had left at these native villages. * * * I boarded a little flat-bottomed Malay river steamer, which * * * floated on down the river to the coast.

LYMAN SIBERIAN EXPEDITION.

The expedition to the Altai Mountains, which was financed by Dr. Theodore Lyman, of Cambridge, Mass., as mentioned in my last report, returned to Washington September 16, 1912. Mr. Ned Hollister, a naturalist of the National Museum, accompanied Dr. Lyman. The expedition resulted in securing 350 mammals for the National Museum and 300 birds for the Museum of Comparative Zoology, Cambridge. The region covered was in the Kurai district, Government of Tomsk. The mammal collection is one of the most important received in recent years, as the region had not been represented in the Museum, and the fauna was of special interest on account of its close relationship with that of North America.

ANTHROPOLOGICAL STUDIES IN SIBERIA AND MONGOLIA.

With the view of securing further information as to the origin of the race that peopled America, a visit was made to certain portions of

Siberia and Mongolia by Dr. Hrdlička, of the National Museum, during the summer of 1912. This work was undertaken partly under the auspices of the Smithsonian Institution and partly in the interest of the Panama-California Exposition of San Diego.

Besides field observations made by Dr. Hrdlička, an examination was made of the anthropological collections in the various Siberian museums in the region covered. He saw or was told of thousands upon thousands of burial mounds, or "kourgans," dating from the present time back to the period when nothing but stone implements were used by man in those regions. And he saw and learned of numerous large caverns, particularly in the mountains bordering the Yenisei River, which yield human remains and offer excellent opportunities for investigation.

A brief account of Dr. Hrdlička's studies is given by him in a pamphlet published in the Smithsonian Miscellaneous Collections, in which he says:

In regard to the living people, the writer had the opportunity of seeing numerous Buriats, representatives of a number of tribes on the Yenisei and Abakan Rivers, many thousands of Mongolians, a number of Tibetans, and many Chinese, with a few Manchurians. * * * Among all these people there are visible many and unmistakable traces of admixture or persistence of what appears to have been the older population of these regions, pre-Mongolian and especially pre-Chinese, as we know these nations at the present day. Those representing these vestiges belong partly to the brachycephalic and in a smaller extent to the dolichocephalic type, and resemble to the point of identity American Indians of corresponding head form. * * *

The physical resemblances between these numerous outcroppings of the older blood and types of northeastern Asia and the American Indian can not be regarded as accidental, for they are numerous as well as important, and can not be found in parts of the world not peopled by the yellow-brown race; nor can they be taken as an indication of American migration to Asia, for emigration of man follows the laws of least resistance or greatest advantage, and these conditions surely lay more in the direction from Asia to America than the reverse.

In conclusion, it may be said that from what he learned in eastern Asia, and weighing the evidence with due respect to other possible views, the writer feels justified in advancing the opinion that there exist to-day over large parts of eastern Siberia, and in Mongolia, Tibet, and other regions in that part of the world, numerous remains, which now form constituent parts of more modern tribes or nations, of a more ancient population (related in origin, perhaps, with the latest paleolithic European), which was physically identical with and in all probability gave rise to the American Indian.

BIOLOGICAL SURVEY OF THE PANAMA CANAL ZONE.

The biological survey of the Panama Canal Zone, organized by the Institution in 1910, was brought to a close during the past year as far as field work was concerned, and some of the results have been published. The natural history collections made by the survey have

added very valuable material to the National Museum series of mammals, birds, fishes, reptiles, and amphibians, land and fresh-water mollusks, flowering plants and ferns, and specimens of microscopic plant and animal life.

ANTHROPOLOGICAL STUDIES IN PERU.

During the past year a second trip was made to Peru by Dr. Hrdlička in continuation of the brief but very interesting researches made by him in that country in 1910. The principal objects of the trip were the mapping out as far as possible of the anthropological distributions of the prehistoric Peruvian, more particularly the coast people; the determination of the physical type of the important Nasca group of people, which represent one of the highest American cultures; further inquiry as to man's antiquity on the west coast of South America; and the extension of Dr. Hrdlička's researches on pre-Columbian pathology. Important collections were made for the National Museum, as well as for the Panama-California Exposition at San Diego. A very perceptible change for the worse was observed in the state of preservation of the ancient remains, both skeletal and archeological. Dr. Hrdlička reports:

The major part of the old population of the extensive coast region were found everywhere to belong to the brachycephalic type, intimately related to the Maya-Zapotec type in the north. The Nasca people were one of the purest groups belonging to this type. Wherever they lived these people of the Peruvian coast were wont to practice, more or less, the anteroposterior head deformation. They have spread along the valleys to the foothills of the Cordillera, and have probably in some instances penetrated into the mountains. Meanwhile, however, they became in many though not all localities more or less mixed, or rather mingled, with dolicho or near dolichocephalic elements which came from or across the mountains.

As to man's antiquity, the results were wholly negative; no trace of man of geological age, nor even of an ancient man of the present epoch, were discovered.

The density of the pre-Columbian population was in some localities greater, in others probably less, than at the present time.

As to pathology, the people of the mountains were found to have been much healthier than those of the coast. The most common disease leaving its traces on the bones in ancient Peru was arthritis. In strictly pre-Columbian cemeteries there was no rachitis, syphilis, tuberculosis, or cancer. Wounds of skull were very common. In the mountains numerous interesting instances of trepanation were discovered.

Further explorations in the mountainous parts of Peru are urgent.

RESEARCHES UNDER THE HODGKINS FUND.

As mentioned in my last report, a limited grant was made from the Hodgkins fund for carrying on certain observations on nocturnal radiation at various altitudes. The results of this research, as also of several other lines of investigation in connection therewith, pro-

vided for by an additional grant, are discussed on another page by Mr. Abbot in his report on the Astrophysical Observatory. There was also allotted from the Hodgkins fund a grant for carrying on aeronautical researches in connection with the Langley Aerodynamical Laboratory, discussed in other paragraphs.

There was in press at the expense of this fund during the year a paper by Dr. Leonard Hill and associates, discussing the results of important researches made by them in London on the influence of the atmosphere of crowded places upon our health and comfort.

SMITHSONIAN TABLE AT NAPLES ZOOLOGICAL STATION.

In order to afford an opportunity for American biologists to study marine life under exceptionally favorable facilities, the Institution for 20 years past has maintained a table at the Naples Zoological Station. Investigators are assigned the use of this table for stated periods on the recommendation of an advisory committee appointed for the purpose. The authorities of the station have on several occasions courteously allowed more than one occupant of the table when there was overlapping in periods of appointment.

During the year covered by the present report Mr. Sidney I. Kornhauser and Mr. Edward C. Day, both of Harvard University, have pursued studies at the Smithsonian table.

THE HARRIMAN TRUST FUND.

Under a special trust fund, established by Mrs. E. H. Harriman, for his investigations in natural history and ethnology, Dr. C. Hart Merriam has equipped two offices, the principal one at Washington, D. C., the other at Lagunitas in west central California, a convenient center for field work on the Pacific coast and a favorable place for the preparation of results.

His principal work during the year has been a continuation of a monographic study of the American bears. Assistance in the way of the loan of specimens has been rendered by all of the larger museums of America, including the Government museums of Canada, at Ottawa and Victoria, and by a number of sportsmen and hunters, who have placed their private material at his disposal. This has been still further augmented by the purchase of specimens, mainly skulls, of rare and little known species, some of which are the only ones in existence. In view of the fact that several species of our large bears are already extinct and others on the verge of extinction, the great value of this material is obvious.

In connection with the study of the big bears a new method has been developed, namely, an intensive study of teeth from photographs. Owing to the large size of bear skulls, it is impossible to

bring the teeth of several individuals near enough together to admit a direct comparison. To obviate this difficulty, the teeth have been photographed natural size. Series of these photographs arranged closely side by side permit direct critical comparison of a number of specimens at one time, favoring the recognition of resemblances and differences not easily detected from the specimens. This method would seem to be available in the case of other groups of large mammals.

Owing to the desirability of completing the study of the bears as early as possible, but little field work was undertaken. Still, a few tribes of Indians were visited, and half a dozen vocabularies collected, completing the series of vocabularies of the 25 existing linguistic stocks of California and Nevada.

AMERICAN SCHOOL OF ARCHEOLOGY IN CHINA.

At a meeting held at the Smithsonian Institution on January 3, 1913, there was discussed the establishment of an American school of archeology in China. The objects of the school as proposed are: (1) To prosecute archeological research in eastern China; (2) to afford opportunity and facilities for investigation to promising and exceptional students, both foreign and native, in Asiatic archeology; and (3) to preserve objects of archeological and cultural interest in museums in the countries to which they pertain in cooperation with existing organizations, such as the Société d'Ankor, etc.

The management of the affairs of the school was placed in the hands of an executive committee of five, consisting of Dr. Charles D. Walcott, Secretary of the Smithsonian Institution; Mr. Charles Henry Butler, reporter of the United States Supreme Court; Dr. Harry Lane Wilson, of Johns Hopkins University; Mr. Charles L. Freer, of Detroit; and Mr. Eugene Meyer, jr., of New York. The general committee consists of 15 gentlemen especially interested in archeological research in China, with Dr. Walcott as chairman and Mr. Butler as secretary. Arrangements were made for a preliminary survey in the Chinese Republic for the information of the general committee in considering the permanent organization of the proposed school.

PUBLICATIONS.

The publications issued by the Smithsonian Institution and its branches during the last fiscal year made a total of 6,260 printed pages, and the aggregate distribution comprised 182,883 copies of pamphlets and bound volumes.

The Institution accomplishes one of its principal objects, "the diffusion of knowledge," by means of its several series of publications which record results of original researches, accounts of explorations,

the progress achieved in science and industry, and general information in all branches of human knowledge believed to be of value to those interested in the promotion of science and the welfare of man.

The Smithsonian Contributions to Knowledge, in quarto form, and the Smithsonian Miscellaneous Collections, in octavo, are printed at the expense of the Smithsonian fund, and necessarily in limited editions, being distributed chiefly to certain large libraries throughout the world, where they are available for public reference. The Smithsonian Annual Report, however, is printed at the expense of congressional appropriations, and in an edition of several thousand copies, thus permitting its wide distribution. The principal feature of the annual report is a general appendix containing about 30 selected or original memoirs illustrating the more remarkable and important developments in the physical and natural sciences, as well as showing the general character of the operations of the Institution.

In addition to the publications mentioned above, there are several other series of works issued under the direction of the Institution through its various branches or bureaus. These include the Annual Report, and the Proceedings and Bulletin of the National Museum; the Contributions from the National Herbarium; the Annual Report and Bulletins of the Bureau of American Ethnology; and the Annals of the Astrophysical Observatory, all of which are Government publications, being printed through annual allotments by act of Congress.

Smithsonian Contributions to Knowledge.—The chief characteristic of memoirs printed in the Contributions to Knowledge is that they are records and discussions of original investigations and constitute important additions to knowledge. Since the establishment of this series in 1848, about 150 of these memoirs have been published in 35 quarto volumes. The most recent memoir of this series, reviewed in my last report, was the "Langley Memoir on Mechanical Flight," recording the experiments of the late Secretary Langley, which resulted in his successful demonstration of the practicability of aerial navigation with machines heavier than air.

Smithsonian Miscellaneous Collections.—In this series 40 papers were issued, forming parts of five volumes, the titles of which are enumerated in the appendix herewith. Among these numerous papers were two articles by the secretary describing further results of his studies of Cambrian fossils, a bibliography of the geology and mineralogy of tin, and a large number of papers descriptive of results of the Smithsonian African expedition under Col. Roosevelt, the Paul J. Rainey African expedition, and the Smithsonian biological survey of the Panama Canal Zone. There were also in press at the close of the year three additional papers on Cambrian fossils, one of them, in particular, giving an account of the Mount Robson region;

and a paper, as already mentioned, by Dr. Leonard Hill and other investigators of the Physical Laboratory of the London Hospital Medical College, discussing the results of experiments to determine "The influence of the atmosphere on our health and comfort in confined and crowded places." The authors conclude that—

No symptoms of discomfort, fatigue, or illness results, so long as the temperature and moisture are kept low, from air rendered, in the chemical sense, highly impure by the presence of human beings. Such air can be borne for hours without any evidence of bodily or mental depression. * * * Heat stagnation is therefore the one and only cause of the discomfort, and all the symptoms arising in the so-called vitiated atmosphere of crowded rooms are dependent on heat stagnation. The moisture, stillness, and warmth of the atmosphere are responsible for all effects, and all the efforts of the heating and ventilating engineer should therefore be directed toward cooling the air in crowded places and cooling the bodies of the people by setting the air in motion by means of fans. * * * The essentials required of any good system of ventilation are, then: (1) Movement, coolness, proper degree of relative moisture of the air, and (2) reduction of the mass influence of pathogenic bacteria. The chemical purity of the air is of very minor importance and will be adequately insured by attendance to the essentials.

Smithsonian Report.—The completion of the annual report for 1911 was long delayed at the Government Printing Office, awaiting a supply of the quality of paper used in that publication. The general appendix of the volume contained 36 articles of the usual character. The report for 1912 was in type at the close of the fiscal year. The popularity of this work continues unabated, the entire edition each year becoming exhausted very soon after its publication.

National Museum publications.—The publications by the Museum during the year comprised two volumes of Proceedings, pamphlet copies of 96 articles from the Proceedings, two Bulletins, and nine parts of volumes of Contributions from the National Herbarium. An interesting work in press at the close of the year, prepared by Assistant Secretary Richard Rathbun, gives a descriptive account of the building recently erected for the departments of natural history of the United States National Museum. The book is illustrated with 34 plates and, besides a general description of the building, includes special chapters relating to structural details and mechanical equipment.

Zoological nomenclature.—Opinions 52 to 56 rendered by the International Commission on Zoological Nomenclature were published in the usual form. The Institution also continues to aid the work of this commission by providing funds for clerical services in connection with the office of its secretary in this country.

Publications of the Bureau of American Ethnology.—The publications issued by the Bureau of American Ethnology were the Twenty-eighth Annual Report, containing papers on Casa Grande, the antiquities of the upper Verde River and Walnut Creek Valleys, Ariz.,

the linguistics of Algonquian tribes; also Bulletin 52 on early man in South America, and Bulletin 54 on the physiography of the Rio Grande Valley, New Mexico.

The Astrophysical Observatory had completed work on volume 3 of the *Annals of the Observatory* at the close of the year, and it was expected that the distribution of the edition would take place soon after July 1.

Reports of historical and patriotic societies.—In accordance with the national charters of the American Historical Association and the National Society of the Daughters of the American Revolution, annual reports of those organizations were submitted to the Institution and communicated to Congress.

Allotments for printing.—The allotments to the Institution and its branches, under the head of "Public printing and binding," during the fiscal year, aggregating \$74,900, were all utilized with the exception of small balances on work in progress at the close of the year. The allotments for the year ending June 30, 1914, are as follows:

For the Smithsonian Institution, for printing and binding annual reports of the Board of Regents, with general appendixes.....	\$10,000
For the annual reports of the National Museum, with general appendixes, and for printing labels and blanks, and for the bulletins and proceedings of the National Museum, the editions of which shall not exceed 4,000 copies, and binding, in half turkey or material not more expensive, scientific books and pamphlets presented to or acquired by the National Museum library.....	37,500
For the annual reports and bulletins of the Bureau of American Ethnology, and for miscellaneous printing and binding for the bureau.....	21,000
For miscellaneous printing and binding:	
International exchanges.....	200
International catalogue of scientific literature.....	100
National Zoological Park.....	200
Astrophysical Observatory (any unexpended balance of 1913 allotment for volume 3 of <i>Annals</i> made available for fiscal year 1914).....	200
For the annual report of the American Historical Association.....	7,000
Total.....	76,200

Committee on printing and publication.—The advisory committee on printing and publication under the Smithsonian Institution has continued to examine manuscripts proposed for publication by the branches of the Institution and has considered various questions concerning public printing and binding. Twenty-two meetings of the committee were held during the year and 138 manuscripts were passed upon. The personnel of the committee as now organized is as follows: Dr. Frederick W. True, Assistant Secretary of the Smithsonian Institution, chairman; Mr. C. G. Abbot, Director of the Astrophysical Observatory; Dr. Frank Baker, Superintendent of the National Zoological Park; Mr. A. Howard Clark, editor of the Smith-

sonian Institution, secretary of the committee; Mr. F. W. Hodge, ethnologist in charge of the Bureau of American Ethnology; Dr. George P. Merrill, head curator of geology, United States National Museum; and Dr. Leonhard Stejneger, head curator of biology, United States National Museum.

Distribution of publications.—On August 23, 1912, a law was enacted requiring that all Government publications must, after October 1, be mailed from the Government Printing Office, mailing lists or labels to be forwarded to the superintendent of documents for that purpose. In accordance with the law, the Smithsonian Report and publications of the United States National Museum and the Bureau of American Ethnology have since been distributed direct from the Government Printing Office. The accumulated stock of publications, aggregating about 100,000 volumes and pamphlets from which constant demands had been supplied, was also transferred to the superintendent of documents during the month of September.

Catalogue of publications.—There is in preparation, and nearly ready for press, a complete list of publications of the Institution and its branches. Partial lists have been issued from time to time but no complete catalogue has been published. The present work will contain about 12,000 titles, being practically a table of contents of the entire series of Contributions to Knowledge, Miscellaneous Collections and Annual Reports of the Institution, the Proceedings, Bulletins, and Annual Reports of the National Museum, the Annual Reports and Bulletins of the Bureau of American Ethnology, and the Annals of the Astrophysical Observatory. The catalogue is so arranged as to permit of ready reference to any desired subject or the collective works of any author appearing in the several series.

LIBRARY.

During the year 12,930 volumes and parts of volumes, chiefly on scientific topics, were added to the Smithsonian deposit in the Library of Congress. The additions to the National Museum library numbered 4,062 volumes and pamphlets. Additions were also made to the libraries of the Astrophysical Observatory, the Zoological Park, the Bureau of American Ethnology, and other office libraries, including the aeronautical library, which it is expected will be utilized chiefly in connection with the work of the Langley Aerodynamical Laboratory organized in May, 1913.

The appropriations for the next fiscal year provide an item of \$15,000 for beginning the construction of metal book stacks in the main hall of the Smithsonian building to contain the library of the Bureau of American Ethnology, a part of the National Museum library, and certain other collections of books now stored in places inconvenient for reference.

In the new building of the National Museum four rooms on the ground floor have been provided with steel book stacks and library appliances of the latest design. To these rooms have been transferred works needed in connection with natural history studies, while books relating chiefly to the arts and industries and to American history are retained in the older Museum building, where the collections of those classes remain on exhibition.

ARCHIVES.

During the year some attention was given to improving conditions in the archive room of the Institution, which was very badly overcrowded. This room, on the fourth floor of the Smithsonian building, was thoroughly overhauled and much accumulated material not relating directly to the history of the Institution was removed to other quarters. The set of Smithsonian publications formerly preserved in this room was temporarily removed to the office of the assistant secretary in charge of library and exchanges, thus making space for manuscript material of importance. Two large wooden cases containing papers relating to the internal affairs of the Institution and its branches, together with other documents, were replaced by metal cases containing drawers equipped with uniform cardboard receptacles for papers, and alphabetical guide cards. It was not found possible, however, to complete the transfer of the papers to these receptacles during the year.

The wooden panels in the doors of the wall cases in the room were removed and replaced by glass, so that it is possible to see the contents of the cases without opening them. A case was provided for maps, plans, charts, and other large objects.

Cases were placed in an adjoining room for the reception of duplicate vouchers and other financial papers of the several branches of the Institution.

The large quantity of Schoolcraft papers at present in the custody of the Institution were transferred to uniform file boxes and placed on shelves. These papers are only partially classified.

The archives are now completely accessible, although a large amount of work is still required to put them into thoroughly satisfactory condition. The principal improvements needed are a complete card catalogue of the several classes of papers contained in the room, with indications of the location of each, and a uniform card index of the contents of the bound volumes of official letters, both originals and press copies. A reclassification of a considerable portion of the other archives is also desirable, as well as the completion of the work of transferring papers to the new cases mentioned above.

LANGLEY MEDAL.

In memory of the late Secretary Samuel Pierpont Langley and his contributions to the science of aerodromics, the Board of Regents of the Smithsonian Institution on December 15, 1908, established the Langley medal, "to be awarded for specially meritorious investigations in connection with the science of aerodromics and its application to aviation." The first award of the medal was voted by the Board of Regents on February 10, 1909, to Wilbur and Orville Wright "for advancing the science of aerodromics in its application to aviation by their successful investigations and demonstrations of the practicability of mechanical flight by man." The medal was presented to each of the brothers Wright at a meeting of the board on February 10, 1910.

The second award of the medal was voted on February 13, 1913, to Mr. Glenn H. Curtiss "for advancing the art of aerodromics by his successful development of a hydroaerodrome whereby the safety of the aviator has been greatly enhanced," and to Monsieur Gustave Eiffel "for advancing the science of aerodromics by his researches relating to the resistance of the air in connection with aviation." The presentation of these medals was made on May 6, 1913. This date was selected in order that the ceremonies incident to the presentation might take place in connection with the observance of "Langley Day," which was established by the Aero Club of Washington in 1911, to commemorate the achievement by Mr. Langley on May 6, 1896, of mechanical flight by a heavier-than-air machine propelled by its own power. On May 6, 1911, and again on May 6, 1912, there were exhibition flights of biplanes and monoplanes near Washington. On the afternoon of May 6, 1913, the celebration by the club occurred at the Army War College immediately after the exercises in the Smithsonian building, and consisted of a reception by the Aero Club, followed by hydroaeroplane, biplane, and monoplane maneuvers.

The presentation exercises in the Smithsonian building preceded the unveiling of the Langley memorial tablet and included addresses by Dr. Alexander Graham Bell in presenting the medals, and acceptances by Ambassador Jusserand in behalf of M. Eiffel, and by Mr. Glenn H. Curtiss.

In the course of his address M. Jusserand said:

We have seen France and America vie with each other not only in the conquest of better, greater, and safer liberty from year to year, but also in the producing of more and more momentous inventions, improving the plane of life of the many, reaching less faulty solutions of the great social problems.

Nothing more striking has taken place on these lines than in what concerns the conquest of the air. It is surely appropriate to remember that one of the very first flights ever attempted took place in Versailles, when one of the earliest balloons rose a fortnight after the treaty definitely securing your inde-

pendence had been signed there in 1783. And you all know that Franklin, when asked, What was the good of such an invention, answered, "What is the good of a new-born child?" The child has grown and is rapidly becoming a giant in power. There is no branch of human activity in which France and America have more truly vied with each other than this one, from the memorable day of the *Montgolfière*, so quickly perfected by the French physicist Charles, to our own time.

Mr. Curtiss said in part:

As I look at the Langley models here, it becomes more evident to me than ever before—the merit of these machines and the great work which Mr. Langley did. We now know, as a result of M. Eiffel's laboratory experiments, that flying planes used by Prof. Langley had a great deal of efficiency, and it is also generally known that the Langley machines, as he built them, had more inherent stability than the models which those of us who followed after Langley used in our first flights. I can not say too much in favor and in memory of Prof. Langley.

LANGLEY MEMORIAL TABLET.

On May 6, 1913, the anniversary of the successful flight of the Langley model aerodrome in 1896, the Langley memorial tablet to commemorate the aeronautical work of the late Secretary Langley, was unveiled in the Smithsonian building in the presence of men prominent in the development of aviation and a large company of invited guests. The tablet was described in my last report. On the occasion of the unveiling of the tablet a memorial address was delivered by Dr. John A. Brashear, one of Prof. Langley's oldest and most cherished friends, and his warm supporter during his long investigations connected with the subject of aerial flight.

CONGRESSES AND CELEBRATIONS.

The Institution each year receives invitations to numerous scientific congresses and celebrations in the United States and abroad, but as funds are not available for the expenses of delegates, few of these invitations can be accepted. In some instances, however, it is possible to arrange for representation by collaborators of the Institution who are visiting the localities, or by members of the scientific staff of the Institution or its branches who are attending at their own expense.

Zoological Congress.—Dr. Leonhard Stejneger, Dr. Ch. Wardell Stiles, and Dr. Herbert Haviland Field were designated to represent the Smithsonian Institution and National Museum and were also designated by the Department of State as delegates on the part of the United States at the Ninth International Congress of Zoology at Monaco, March 25 to 30, 1913.

Applied chemistry.—The opening meeting of the Eighth International Congress of Applied Chemistry was held in Washington on September 4, 1912, with subsequent meetings in New York. Prof.

F. W. Clarke was designated to attend the congress as the representative of the Institution. The congress made the Secretary of the Institution one of its honorary vice presidents.

Prehistoric anthropology.—Dr. Aleš Hrdlička, Dr. Charles Peabody, and Dr. George Grant MacCurdy were designated to represent the Smithsonian Institution and the United States at the Fourteenth International Congress of Prehistoric Anthropology and Archeology at Geneva, September 9 to 15, 1912.

Hygiene and demography.—The Fifteenth International Congress on Hygiene and Demography was held in Washington from September 23 to 28, 1912, under the auspices of the Government of the United States, President William Howard Taft serving as honorary president. Your secretary was a member of the local committee on organization, and Mr. W. H. Holmes, of the National Museum, served on the interdepartmental committee on exhibits.

Archeological Congress.—The Third International Congress on Archeology was held at Rome, October 9 to 16, 1912. Upon the nomination of the Smithsonian Institution the Department of State designated Prof. A. L. Frothingham, of Princeton, Prof. George M. Whicher, secretary of the New York Society of the Archeological Institute of America, and Mr. William H. Buckler, president of the Baltimore Society of the Archeological Institute of America, as delegates on the part of the United States at that congress.

Historical studies.—Prof. J. Franklin Jameson, of the American Historical Association, was designated to act as the representative of the Smithsonian Institution at the International Congress of Historical Studies held in London, April 3 to 8, 1913, under the auspices of the British Academy in cooperation with British universities, learned societies, and institutions.

Geological Congress.—Your secretary, as a member of the Twelfth International Congress of Geology, arranged to be at Toronto August 7 to 14, 1913, and was appointed to represent the Carnegie Institution of Washington and the Washington Academy at that congress. Dr. George P. Merrill, head curator of geology in the National Museum, was appointed a representative of the Smithsonian Institution.

Congress of Americanists.—Arrangements have been progressing during the year in connection with the Nineteenth International Congress of Americanists, which has been invited to meet in Washington in 1914, and Mr. W. H. Holmes, Mr. F. W. Hodge, and Dr. Aleš Hrdlička have been appointed an auxiliary committee to represent the Smithsonian Institution in connection with the preliminary details respecting the proposed meeting.

The State education building at Albany was dedicated October 16, 1912, on which occasion the secretary presented the formal con-

gratulations of the Smithsonian Institution, which is specially interested in the city of Albany, for it was there that Joseph Henry, first secretary of the institution, was born in the year 1799, and there Henry began his researches and experiments in electricity which in great measure made possible the wonderful electrical achievements of the present day. "He married the intensity magnet to the intensity battery, the quantity magnet to the quantity battery, discovered the law by which their union was effected, and rendered their divorce impossible." The intensity magnet is that which is to-day in use in every telegraph system. "Henry's oscillating machine was the forerunner of all our modern electrical motors. The rotary motor of to-day is the direct outgrowth of his improvements in magnets."

National Academy of Sciences.—The semicentennial meeting of the National Academy of Sciences was held at the Smithsonian Institution April 22 to 24, 1913. The exercises included an address of welcome by Dr. Ira Remsen, president of the academy, and addresses on "The Relation of Science to the Higher Education in America," by President Arthur T. Hadley, of Yale University; "International Cooperation in Research," by Dr. Arthur Schuster, of London; "The Earth and Sun as Magnets," by Dr. George E. Hale, of the Mount Wilson Solar Observatory; and "The Structure of the Universe," by J. C. Kapteyn, of Groningen. At the White House, President Woodrow Wilson and Dr. R. S. Woodward participated in the ceremony of the presentation of medals awarded by the academy. The Watson medal was awarded to Prof. J. C. Kapteyn, the Draper medal to M. Henri Deslandres, the Agassiz medal to Dr. Johan Hjort, and the Comstock prize to Prof. R. A. Millikan. There were various social functions in connection with the meeting, including an evening reception in the natural history building of the National Museum. On the occasion of the meeting of the academy there was published "A History of the First Half Century of the National Academy of Sciences, 1869-1913," prepared and edited by Dr. Frederick W. True, assistant secretary of the Smithsonian Institution.

Imperial Russian Museum.—On the occasion of the fiftieth jubilee of the Imperial Moscow and Rumiantsef Museum your secretary was elected an honorary member of that institution.

GEORGE WASHINGTON MEMORIAL BUILDING.

In the public buildings bill approved by the President on March 4, 1913, permission was granted to the George Washington Memorial Association to erect a building on the square formerly occupied by the Pennsylvania railway station in Washington. The preamble of the original bill (S. 5494), as passed by the Senate April 15, 1912, defined the objects of the Memorial Building as follows:

To provide a site for the erection of a building to be known as the George Washington Memorial Building, to serve as the gathering place and headquarters of patriotic, scientific, medical, and other organizations interested in promoting the welfare of the American people.

Whereas George Washington, on July ninth, seventeen hundred and ninety-nine, said: "It has been my ardent wish to see a plan devised on a liberal scale which would spread systematic ideas through all parts of this rising Empire," and it was Washington's wish to materially assist in the development of his beloved country through the promotion of science, literature, and art, and with the firm conviction that "knowledge is the surest basis of public happiness"; and

Whereas the changing conditions that time has brought require new methods of accomplishing the results desired by Washington and now a necessity of the American people; and

Whereas at the present time there is not any suitable building in the city of Washington where large conventions or in which large public functions can be held, or where the permanent headquarters and records of national organizations can be administered; and

Whereas a building should be provided in which there shall be a large auditorium, halls of different sizes where all societies pertaining to the growth of our best interests can meet, and such as it is deemed desirable may have permanent headquarters; and

Whereas the George Washington Memorial Association is now engaged in obtaining funds for the erection and endowment of a building suitable for the purposes above set forth, to be known as the George Washington Memorial Building: Therefore * * *

The law as passed by Congress and approved by the President March 4, 1913, was as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

* * * * *

Sec. 10. That a building is hereby authorized to be erected in the District of Columbia, to be known as the George Washington Memorial Building.

The control and administration of said building, when erected, shall be in the Board of Regents of the Smithsonian Institution.

The George Washington Memorial Association is authorized to erect said building in accordance with plans to be procured by said association and to be approved by the Commission of Fine Arts, said building to be fireproof, faced with granite, and to cost not less than \$2,000,000; it shall have an auditorium that will seat not less than six thousand people, and such other smaller halls, reception rooms, office rooms, and so forth, as may be deemed necessary to carry out the purposes for which the building is erected. And the said George Washington Memorial Association shall in addition provide a permanent endowment fund of not less than \$500,000, to be administered by the Board of Regents of the Smithsonian Institution, the income from which shall, as far as necessary, be used for the maintenance of the said building.

Permission is granted the George Washington Memorial Association to erect said building in the north end of the reservation known as Armory Square, bounded by Sixth and Seventh Streets west and B Street north and B Street south. The south front of said building is to be on a line with the south front of the new National Museum Building, in the north end of the Smithsonian Park; and the said land is hereby set apart for that purpose: *Provided*, That the actual construction of said building shall not be undertaken until the sum

of \$1,000,000 shall have been subscribed and paid into the treasury of the George Washington Memorial Association: *And provided further*, That the erection of said George Washington Memorial Building be begun within a period of two years from and after the passage of this act, and this section shall be null and void should the George Washington Memorial Association fail to comply with the provisions thereof which are conditions precedent to the authorization herein granted.

Said building may, among other purposes, be used for inaugural receptions and special public meetings authorized by Congress.

Congress may alter, amend, add to, or repeal any of the provisions of this section.

The need in Washington of such a structure as here authorized has been urged on many occasions in public meetings throughout the country. The Regents of the Smithsonian Institution have expressed their willingness to administer it when completed. It will be a gathering place and headquarters for patriotic, scientific, medical, and other organizations interested in promoting the welfare of the American people and the development of the country in science, literature, and art.

Plans for the building are being made, and it is hoped that the work of construction will begin within the time limit set by the law.

THE NATIONAL MUSEUM.

The operations of the National Museum are discussed with such detail by Assistant Secretary Rathbun in the appendix to the present report that I need here refer only to some of the more important features of the year.

The completion of the natural history building, with its spacious well-lighted halls, has made it feasible to vastly improve the extensive exhibits of the departments of anthropology, biology, and geology installed therein; while objects pertaining to the industrial arts and to American history are now given ample exhibition room in the older building.

In the zoological halls of the new building are exhibited a number of groups of animals which are noteworthy examples of the art of taxidermy, some of these groups being made up of specimens received from the Smithsonian African expedition under Col. Roosevelt. And likewise in the halls devoted to anthropological exhibits are shown a number of racial groups of mankind, including several representing Indians of various tribes engaged in their native games and mechanical occupations, which seem particularly attractive to visitors.

The department of arts and industries for many years had been checked in its development by what seemed to be the more urgent demand for space for natural history exhibits. Many large and interesting collections illustrative of the industrial arts, acquired

by the Museum during the last 30 years, had therefore necessarily been held in storage, but the transfer of objects of natural history to the new building has now released large halls for the installation of instructive collections pertaining to art textiles, silk, wool, and cotton manufactures, to arms and armor, ceramics, mineral technology, and to some other general manufacturing industries, including an exposition of the processes and of the raw materials and finished products.

The responses received from requests for objects desired to complete particular series in this department are very gratifying and indicate a public interest in its still broader development. The educational character of these exhibits, and, in fact, of all objects displayed in the National Museum, is kept constantly in mind. Thus, a small number of specimens or objects well arranged is found to be far better than a large display where the educational feature is overshadowed by what may be termed a picturesque method of installation. The style of cases, the color of the background, and many other details must be carefully studied and worked out with a view to proper harmony in every respect.

There has been added to the Museum collections an approximate total of 302,133 specimens and objects, as compared with 238,000 during the year preceding. The accessions included 140,015 botanical, 113,509 zoological, and 14,716 paleontological specimens, besides a number of paintings, art textiles, useful plant products, and objects illustrative of American history.

In geographical range the accessions covered practically the entire world, ethnological, archeological, biological, and geological objects being received from all parts of North and South America, from Alaska, Siberia, China, Oceanica, Dutch East Indies, Africa, and other lands, the results in large measure of explorations undertaken by the Smithsonian Institution and National Museum either directly or in cooperation with private individuals or Government departments. Among individuals who have thus served the Museum during the year, some of whom I have already mentioned, were Mr. Childs Frick, who made collections, especially of birds, in Africa; Dr. Theodore Lyman, who hunted animals in the Altai Mountains in Asia; Dr. W. L. Abbott, who continued his collecting work in Kashmir and generously provided for field work in Borneo; Mr. D. D. Streeter, jr., who explored the interior of Borneo; Mr. George Mixer, who visited Lake Baikal in Siberia; and Mr. Copley Amory, jr., who made collections of mammals and of fossil species in Alaska.

One of the interesting additions to the mammal division was a mounted specimen and skeleton of the rare okapi of Africa. Several noteworthy collections of fossil invertebrates were also received, and among accessions of vertebrate remains were a large series of

mammals from the Fort Union beds of Montana, and many genera and species from recently uncovered Pleistocene cave deposits in Maryland; also a series of bones from the Yukon territory containing the first evidence of the former extension of the range of the camel beyond the Arctic Circle.

The most important permanent addition to the division of history was the gift by Mr. Eben Appleton of the "Star Spangled Banner," which he had allowed to be exhibited as a loan since 1907. This great flag, about 30 feet square, is the one that waved over Fort McHenry in September, 1814, and inspired Francis Scott Key to write the national anthem.

The division of prehistoric anthropology has received several large and valuable accessions of skeletal remains during recent years, one of the most important recent additions being obtained in Mongolia, where the curator was engaged in studies to discover the probable origin of the American Indians.

The National Gallery of Art was enriched by the gift of 12 paintings, 7 of them presented by Mr. William T. Evans, and by 18 paintings and 2 marble sculptures received as loans from friends of the Gallery.

It has been the custom for many years to distribute to schools and colleges for teaching purposes, or to exchange with other institutions, such duplicate natural history specimens as are no longer needed for scientific study by the Museum staff. During the past year about 30,000 specimens were thus utilized for educational purposes or to secure new material for the Museum.

The number of visitors to the new building during the year was 261,636 on week days and 58,170 on Sundays, the largest attendance being 13,236 on March 5, the day following the inauguration of the President.

The publications issued by the Museum included about 100 papers from the Proceedings and a number of Contributions from the National Herbarium, besides two completed volumes of Proceedings and two Bulletins. The total distribution of earlier and current publications was 71,600 copies.

Mention is made on another page of the fitting up of rooms in the new building for the accommodation of such portions of the Museum library as pertain chiefly to natural history subjects, books on other topics being retained in the older buildings. The total contents of the library at the close of the year was 43,692 volumes and 72,042 papers of all kinds.

Meetings of various scientific organizations were held in the Museum auditorium and adjacent rooms, and there were several formal receptions which are noted in the report of the assistant secretary.

BUREAU OF AMERICAN ETHNOLOGY.

Ethnological researches have been continued in accordance with law, among the American Indians and the natives of Hawaii, including the excavation and preservation of archeological remains. The systematic researches carried on by eight ethnologists of the regular staff and by specialists not officially connected with the bureau covered a wide range of field work and office studies, which are described in such detail in the appendix by the ethnologist-in-charge, that I need here to review but briefly some of the most important activities of the year. For the preparation of a memoir on *The Culture History of the Aborigines of the Lesser Antilles*, Dr. Fewkes visited Trinidad, Barbados, St. Vincent, and other islands of the West Indies, where he made extensive excavations of shell-heaps, particularly in Trinidad and St. Vincent, yielding very interesting collections of pottery and other objects, and carried on archeologic studies which proved to be especially important in throwing light on the material culture of the former aborigines of the coast adjacent to South America.

Studies were continued in the investigation of Indian population, a research covering the whole period from the first occupancy of the country by white people to the present time, and including the entire territory from the Rio Grande to the Arctic Ocean. A monograph in preparation on this subject includes chapters on notable epidemics, vital statistics, and race admixture.

Further interesting studies were made in New Mexico in preparation of a memoir on the philosophy, anthropic worship and ritual, zoic worship, social customs, material culture, and history of that interesting and conservative Pueblo people known as the Tewa Indians.

A large amount of additional material was also obtained concerning the languages, myths, and legends of the Fox Indians and other Algonquian tribes, and on the ceremonies and rituals of the Osage and Pawnee Indians.

Progress has been made in the preparation of the *Handbook of American Indian Languages* and the *Handbook of American Archeology*. There is also in preparation a *Handbook of Aboriginal Remains East of the Mississippi*.

Some of the results of investigations conducted by the bureau in cooperation with the School of American Archeology are described in three memoirs, now published or ready for publication, on *The Physiography of the Rio Grande Valley, New Mexico, in Relation to Pueblo Culture*, *The Ethnobotany of the Tewa Indians*, and *the Ethnozoology of the Tewa Indians*, and there is also in process of completion in this connection a manuscript entitled "*An Introduction to the Study of the Maya Hieroglyphs.*"

The Handbook of American Indians, completed by the bureau a few years ago, has increased the popular interest in our aborigines to such an extent that the bureau is considering the feasibility of issuing a series of treatises devoted to the Indians of the respective States, and as a beginning for such a series there is in preparation a Handbook of the Indians of California.

Among the publications issued during the year may be mentioned the Twenty-eighth Annual Report; a reprint of the Handbook of American Indians North of Mexico, ordered by resolution of Congress; a bulletin on Early Man in South America; portions of Part 2 of the Handbook of American Indian Languages; and a bulletin on Chippewa Music.

The scope of the work undertaken by the bureau is necessarily limited by the funds available. Among investigations that are specially desirable to extend may be mentioned the exploration and preservation of antiquities, including the cliff dwellings in the arid region; ethnological researches in Alaska; the extension of ethnological investigations among the tribes of the Mississippi drainage; and excavation and study of archeological remains in the South and West.

INTERNATIONAL EXCHANGES.

The work of the International Exchange Service shows a steady gain from year to year. During the last 15 years the weight of matter handled has increased from 317,883 pounds in 1898 to 593,969 pounds in 1913, and the total number of packages has increased during that period from 84,208 in 1898 to 338,621 in 1913. As compared with the year 1908, 66 per cent more packages were handled in 1913 and 678 more boxes were dispatched, but by practicing various economies and improving methods the increased work has been accomplished without an increase in the annual appropriation.

In addition to the international exchange of publications between Governments and institutions of learning, the service has from time to time been called upon by foreign Governments and societies to secure information on particular subjects. To answer such inquiries has sometimes required much correspondence. Thus, in a recent instance, the minister of public works and mines in a distant country sought information through the Department of State on laws and regulations with respect to the boring, mining, and storage of petroleum in the United States, a class of data which the Smithsonian Institution was able to obtain only by writing to the principal States concerned in that industry.

In order to simplify the shipment of exchanges to the Union of South Africa arrangements have been made whereby packages are now shipped in bulk to the Government Printing Works at Pretoria for distribution instead of being sent to miscellaneous addresses in

the various provinces of the Union. This method will effect a saving to the Institution in freight charges and improve the service with South Africa. A similar method would be very advantageous with the Commonwealth of Australia and is now under consideration by the Australian House of Representatives and the chairman of the library committee of that country.

In Egypt there has been organized the Government publications department at Cairo, to which consignments for distribution there are now being forwarded. In Mexico a service of exchanges has been established in the department of public works.

Full sets or partial sets of United States official documents are now sent to 92 foreign depositories, the Province of Bombay, the Corporation of Glasgow, Finland, British Guiana, the Free City of Lubeck, and the Province of Madras having been added to the list during the year. There has also been carried on since 1909, through the Exchange Service, an interparliamentary exchange of official journals with legislative chambers agreeing thereto, 100 copies of the daily issue of the Congressional Record being provided for that purpose. Thirty-two countries have so far agreed to this exchange of their official journals.

NATIONAL ZOOLOGICAL PARK.

The National Zoological Park was established by act of Congress in 1890 "for the advancement of science and the instruction and recreation of the people." It was the outgrowth of a small collection of living animals which for several years had been assembled in low sheds and small paddocks adjacent to the Smithsonian building, where they were kept primarily for scientific study, though they were likewise a constant source of interest to the public. There was at once a rapid increase in the size of this collection when the animals were removed to the spacious grounds provided for them in the beautiful Rock Creek Valley, and it is evident from its increasing popularity during the last 23 years that the establishment of this great zoological park has been regarded as a wise investment of public funds.

The popular interest in the park has continued to be very great. On Sundays and holidays the walks and buildings are crowded. During the past year the number of visitors was 633,526, and the daily average in the month of March, 1913, was 3,900. One hundred and forty-two classes, schools, etc, numbering 5,579 pupils, visited the park during the year with the definite purpose of studying the animals.

The interests of science have also been primary objects of attention in the administration of the park. A number of species of

American animals which were rapidly becoming extinct are here preserved in appropriate natural surroundings. In a recent report I called attention to a much needed improvement that should be made in the erection and equipment of a laboratory and hospital in the park whereby the welfare of the animals could be more thoroughly guarded, and where investigations of a zoological nature could be prosecuted for the increase of practical and scientific knowledge.

The number of animals of all kinds in the park collections on June 30, 1913, was 1,468, representing 154 species of mammals, 202 species of birds, and 31 species of reptiles, which are enumerated in detail on another page in the report of the superintendent. The important additions during the year included a pair of young African elephants, three dromedaries, a pair of cheetahs, several species of gazelles, and other animals from the Government Zoological Garden at Giza, Egypt; 7 ostriches from southern California; and 2 moose, a male and a female, from the Rocky Mountains National Park in Alberta.

Among the improvements completed in the park during the year was an outdoor parrot cage constructed through the generosity of Mr. John B. Henderson, jr., one of the regents of the Institution. An inclosure was also built for the ostriches recently received and one for the wood ducks and related species. Mention should also be made of the erection of a stone building, 24 by 40 feet, equipped for the cooking of food for the animals by boiling or baking, and also for cold storage. The building is abundantly lighted and thoroughly sanitary, and is a great improvement over the inadequate quarters heretofore used for food preparation.

An appropriation of \$20,000 was included in the sundry civil act for 1913 for the construction of a stone-faced or boulder bridge across Rock Creek to replace the log bridge erected in 1896 on the line of the roadway from Adams Mill Road. A contract for the construction of the new bridge was entered into on May 29, 1913, and work was begun soon after the close of the fiscal year. The bridge will be 80 feet in span and about 40 feet wide. It will be built of reenforced concrete faced with rough blocks of the blue gneiss found in this region, the stone for the concrete being obtained in the park.

In the sundry civil act for the fiscal year 1914 provision is made for the purchase of about 10 $\frac{2}{3}$ acres of land to extend the west boundary of the park to Connecticut Avenue. The acquisition of this land has been urged for several years as a much-needed addition to the area of the Zoological Park.

THE ASTROPHYSICAL OBSERVATORY.

The Astrophysical Observatory continued during the past year the important investigations begun during the administration of the late Secretary Langley to determine the solar constant of radiation and the variability of the sun. In his account of the operations of the observatory on another page of this report Director Abbot discusses the results of these researches up to the present time and concludes that the observations at Bassour, Algeria, taken in connection with those made simultaneously at Mount Wilson, Cal., have established the variability of the sun. He concludes also that a variability connected with the sun-spot cycle has been shown.

Observations were also made to determine the effects of volcanic eruptions on climate. Soon after the eruption of Mount Katmai, Alaska, in June, 1912, the presence of dust in the upper air from this volcano was indicated both in California and in Algeria, and in August the direct radiation of the sun was found to be reduced about 20 per cent by the interposition of the dust cloud. Mr. Abbot and Mr. Fowle discuss the results of their observations and the general subject of "Volcanoes and Climate" in a paper in the Smithsonian Miscellaneous Collections. They conclude that a combination of the effects of sun spots and volcanic haze accounts for all the principal irregularities in the temperature of the earth for the last 30 years.

In connection with observations on nocturnal radiation it became necessary to determine the temperature and humidity prevailing above certain stations. This was accomplished with the cooperation of the United States Weather Bureau through the use of sounding balloons and captive balloons carrying to high altitudes self-recording apparatus for measuring the temperature, pressure, and humidity of the air.

There was completed during the year volume III of the Annals of the Astrophysical Observatory, recording the work accomplished from 1907 to 1913.

INTERNATIONAL CATALOGUE OF SCIENTIFIC
LITERATURE.

There is administered by the Smithsonian Institution through a small annual appropriation by Congress, the United States Bureau of the International Catalogue of Scientific Literature. This is one of the 33 regional bureaus whose function it is to collect, index, and classify all scientific publications of the year in each country and to send the classified references to the central bureau in London, where, since 1901, they have been collated and published in a series

of 17 annual volumes which form an index to current scientific literature.

The catalogue is not of a commercial character, but by economical methods of administration, and partly through the revenue obtained from subscriptions to the series of volumes, it is hoped that the enterprise will be self-supporting with the exception of the general expenses of the regional bureaus in gathering the data.

The United States bureau sent to the central bureau during the past year 27,995 cards, making a total of 290,330 cards forwarded from this country since the work was begun in 1901. The total number of classified citations received at the central bureau in London from 1901 to 1913 was about 2,500,000.

Although the congressional appropriation for the bureau is intended primarily for maintaining a purely scientific international enterprise, yet, without added expense, the bureau is of value to the public as a source of general information on many scientific subjects. The Smithsonian Institution is in constant receipt of requests for information on a very great variety of topics, and since it is the purpose of the International Catalogue to collect and classify the published results of scientific investigation many of these inquiries are referred for reply to this bureau.

NECROLOGY.

JAMES SCHOOLCRAFT SHERMAN.

At the annual meeting of the Regents on December 12, 1912, the following resolutions were adopted to the memory of Vice President Sherman:

Whereas the Board of Regents of the Smithsonian Institution have received the sad intelligence of the death on October 30, 1912, of James Schoolcraft Sherman, Vice President of the United States and Chancellor of the Institution, therefore, be it

Resolved, That in the passing away of this distinguished official the country has lost a man whose unsullied public career and blameless private life marked him as one of the best exemplars of the highest type of American patriotism and citizenship; while this Institution has been deprived of the association of a Regent and presiding officer whose loyalty to its purposes and zeal in its interests have been an inspiration to his colleagues.

Resolved, That we tender to the family of Mr. Sherman our respectful and sincere sympathy in their great bereavement,

Resolved, That an engrossed copy of these resolutions be transmitted to the family of the late chancellor.

James Schoolcraft Sherman, LL.D., born in Utica, N. Y., October 24, 1855, became a Regent of the Smithsonian Institution upon taking the oath of office as Vice President of the United States on March 4, 1909, and was elected Chancellor of the Institution on December 8, 1910, as successor to Chancellor Melville Weston Fuller, Chief Justice

of the United States, who died July 4, 1910. Mr. Sherman received the degree of LL.B. from Hamilton College in 1878 and LL.D. in 1903. He was admitted to the bar in 1880 and practiced his profession at Utica; was mayor of Utica, 1884-85; Member of Congress, 1887 to 1891 and 1893 to 1909, and was elected Vice President November 3, 1908. He had been trustee of Hamilton College since 1905, and held important positions of trust in his native city.

JOHN BROOKS HENDERSON.

At a special meeting of the Regents on May 1, 1913, a resolution was adopted in memory of the Hon. John B. Henderson, who served as a Regent from January 26, 1892, to March 1, 1911, when he felt obliged to retire from active duties on account of failing health. His sound judgment and wise counsel as chairman of the executive committee and as member of the permanent committee had been of great assistance to the board throughout his long term of service. Mr. Henderson was born near Danville, Va., on November 26, 1826, and died at Takoma Park, District of Columbia, on April 12, 1913. He was United States Senator from Missouri from 1862 to 1869, and filled many other honorable positions during earlier and later periods of his life. He had been a resident of Washington City since 1890.

Respectfully submitted.

CHARLES D. WALCOTT, *Secretary.*

APPENDIX 1.

REPORT ON THE UNITED STATES NATIONAL MUSEUM.

SIR: I have the honor to submit the following report on the operations of the United States National Museum for the fiscal year ending June 30, 1913:

IMPORTANT MATTERS OF THE YEAR.

Although many important matters developed, as usual, in connection with the operations of the Museum during last year, those of chief general interest related to the exhibition collections in the new building and to the progress of work in the department of arts and industries. As explained in the last report, only the first and second stories of the new building, with an aggregate floor area of 185,294 square feet, are being utilized at present for the permanent installations, which, with a single exception, relate wholly to natural history. The last of this space was opened to the public during April, 1913, but to a certain extent the exhibits still remain incomplete and the arrangements provisional. The plan of three wings particularly adapts this building to the three departments of anthropology, biology, and geology, representing the organization of the natural history collections, each of which has been allotted an entire wing for its exhibition series, the overflow from each being continued into the adjacent ranges.

Of the several branches which are administered in the department of anthropology, three have been established in the new building as constituting what is now commonly recognized in museum classification as one of the great divisions of natural history. They are physical anthropology, ethnology, and archeology. Physical anthropology is not yet represented in the public halls, though an important installation of a technical character has been provided in the laboratory. Each of the other subjects, however, has been extensively illustrated on a popular though none the less instructive basis, to which purpose a total floor area of 65,941 square feet has been assigned. Ethnology occupies the entire available space allotted to the department in the first story, namely, the northern section of both ranges, and all parts of the north wing surrounding the picture gallery, which is temporary in its location here. The total area covered is

35,474 square feet. The arrangement is geographical, and the exhibits find their key in family groups placed centrally in the halls. The archeological collections are displayed in the second story, the Old World series, both historic and prehistoric, occupying the eastern side and northern end of the wing to the extent of about 7,927 square feet, and the New World series the eastern side of the wing and the entire east range, with a floor area of 22,540 square feet. The exhibition of North American archeology is especially full and important.

The classification of the biological exhibits, at present restricted to zoology, comprises five principal and several minor subdivisions, of which the most extensive consists of a comprehensive representation of all the main groups of animals, each arranged faunally. Next follow a systematic series, a series illustrating comparative anatomy and osteology which is practically subsidiary to it, a series of domestic animals, and a faunal series for the District of Columbia. These are supplemented by a number of special exhibits illustrating interesting phases in zoology and noteworthy features of the collection. The entire amount of space assigned to the department is 64,398 square feet, of which the faunally arranged exhibit utilizes 41,058 square feet. The mammals in this collection occupy the first floor of the west wing, with the exception of a small area in which the series of birds begins, the latter extending thence through the western section of the west range; while the reptiles, batrachians, fishes, and invertebrates are installed in the second story of the wing. On the northern side of the wing is the collection of comparative anatomy and osteology, followed successively in the west range by the systematic series, the domestic animals, and the faunal exhibit of the District of Columbia, the special exhibits being provided for in alcoves on the court side of the range.

The geological exhibits are classified under four subjects, namely, systematic or physical and chemical geology, applied geology, mineralogy and paleontology. Besides the east wing, of which they have entire possession, they occupy only the eastern section of the adjoining range in the first story, the combined area amounting to 47,691 square feet. Systematic geology is displayed in the range, while applied geology, including the most complete series of building and ornamental stones in the country, and mineralogy, with the beginnings of an excellent representation of gems and precious stones, are accommodated in the second story of the wing. In the lower story, which is wholly devoted to paleontology, the fossil vertebrates, with many skillfully prepared remains of extinct animals and several large and striking skeletons, occupy the large sky-lighted hall and eastern end of the wing, the fossil invertebrates the southern side of the wing, and the fossil plants the northern side.

In the matter of reorganizing the several industrial collections which were long ago displaced through the overcrowding of the older buildings in which they are now being rearranged, excellent progress was made despite the limited means available. The division of mineral technology, which had been nominally recognized for several years and for which a large amount of valuable material has been held in storage, was actively established, but not until late in the year. In the division of textiles, in which the work was started over a year earlier, the results accomplished have been sufficient to very materially attract public notice. The old collection, including also certain animal and vegetable products, was first unpacked, and, although much of it had so greatly deteriorated as to be rendered useless, there remained an excellent nucleus to build upon, the material being chiefly serviceable for its bearing on the history and development of the subjects represented. It was extensively drawn upon in preparing a preliminary exhibition series, which was practically completed before the close of the fiscal year 1912. During last year there was marked activity in the acquisition of new material, in the extension of the exhibition collections, and in the general work of the division. Many of the leading manufacturers were advised with, and their cordial approval of the plans and the substantial support they have already given the Museum insures beyond question the building up of a thoroughly practical representation of the textile and allied industries. The accessions of the year covered a wide range of materials and manufacture, and included raw materials, intermediate stages, and finished products, as well as illustrations of various processes. They were almost wholly from American sources, among the exceptions being an instructive exhibit of the woolen industry of Bradford, England, and another of native Filipino handicraft in the making of mats, baskets, hats, fabrics, and other useful articles. In lines other than textiles the additions related mainly to the utilization of rubber, and included many testimonials to Charles Goodyear, whose name is indissolubly connected with the origin and early advancement of this important industry. The installation of textiles kept pace with the receipt of materials, and by the close of the year a very notable and attractive exhibition had been assembled, mainly in the south hall of the older building.

COLLECTIONS.

The total number of specimens acquired during the year was approximately 302,132, of which 26,999 pertained to the several subjects covered by the department of anthropology; 113,509 were zoological, 140,015 botanical, 5,569 geological, and 14,716 paleontological; while 12 were paintings for the National Gallery of Art, and 1,312 were textiles and useful plant products for the department of arts and industries. Several important loans for exhibition, consist-

ing mainly of historical and ethnological objects and paintings, were also received.

The additions in ethnology came mainly from the Philippine Islands and other parts of the Far East, from Paraguay and Dutch Guiana, and from the middle and western United States. Maine, Pennsylvania, Maryland, Virginia, and Kentucky were chiefly represented in the contributions to prehistoric archeology, while Egyptian and Greco-Roman antiquities and small lots of materials from various European localities composed the principal acquisitions in historic archeology. The division of physical anthropology received valuable accessions, mainly of skeletal remains, from many sources, the most noteworthy consisting of a large collection made by the curator in Mongolia. In the division of mechanical technology the most extensive additions were to the section of firearms and other weapons, and included several early and rare pieces; while in the division of graphic arts they were illustrative of recent methods of pictorial reproduction. Most prominently to be noted in connection with the division of history was the gift by Mr. Eben Appleton of "The Star Spangled Banner," which had been exhibited as a loan since 1907. This witness of the gallant defense of Fort McHenry during its unsuccessful bombardment by the British fleet on September 13 and 14, 1814, immortalized by the stirring verses of Francis Scott Key, has been accorded a conspicuous place of honor in the principal hall of history. Among other notable acquisitions were memorials of the Washburn family and of Generals U. S. Grant and Frederick D. Grant; a bronze cannon, with its wooden carriage, brought to America by General Lafayette and used in the Revolution; over 21,000 postage stamps and postal cards, added to the large collection from the Post Office Department; the *Titanic* memorial gold medal issued by the Carnegie Hero Fund Commission; and, as a loan, the collection of historical china assembled by the late Rear Admiral F. W. Dickins, United States Navy, consisting of about 500 pieces, and including a large number of fine examples of presidential china from the administration of Washington to that of Benjamin Harrison.

For some of its most important acquisitions the department of biology was indebted to several expeditions to distant regions, conducted at private expense. The most extensive of these, undertaken by Mr. Childs Frick, who was accompanied by Dr. E. A. Mearns, United States Army (retired), and others, visited Abyssinia and British East Africa, and was absent from January to September, 1912. The birds obtained, numbering over 5,000, have been deposited in the Museum. On a hunting trip to the region of the Altai Mountains, in Asia, Dr. Theodore Lyman, of Harvard University, with the assistance of Mr. N. Hollister, of the Museum staff, secured about 650 specimens of mammals and birds, which have been shared be-

tween the Museum of Comparative Zoology and the National Museum. Dr. W. L. Abbott, who continued his collecting work in Kashmir, also maintained a naturalist in Borneo to extend the field work which he had so effectively carried on for several years. From the former region a large number of small mammals were received during the year, and from the latter many specimens of mammals, birds, and reptiles. Mr. Arthur de C. Sowerby transmitted mammals and reptiles from China; Mr. D. D. Streeter, jr., collected mammals and reptiles in Borneo; Mr. George Mixter visited Lake Baikal, Siberia, and its vicinity, securing specimens of the native bear, of the seal peculiar to the lake, and of a number of small mammals; and Mr. Copley Amory, jr., joining a Coast Survey party in Alaska, obtained many mammals, including several caribou and an interesting series of bones of fossil species. Mr. A. C. Bent in the course of investigations in Newfoundland and Labrador made collections of birds, and Dr. Paul Bartsch and Dr. T. Wayland Vaughan, as guests on the Carnegie steamer *Anton Dohrn*, collected marine invertebrates among the Florida Keys, as did also Mr. John B. Henderson, jr., by means of dredgings from his yacht *Eolis*. Mr. Paul G. Russell, of the division of plants, who accompanied an expedition of the Carnegie Institution to the West Indies, secured for the Museum several thousand botanical specimens.

The division of mammals was fortunate in obtaining an exceptionally fine mounted specimen and skeleton of the rare okapi from the Kongo region of Africa. The principal accessions of fishes and marine invertebrates were from explorations by the Bureau of Fisheries in various parts of the Pacific Ocean, consisting mainly of collections that had been studied and described. Among fishes were the types of 110 new species, while the marine invertebrates included extensive series of crustaceans and echinoderms, besides ascidians and plankton material from the Atlantic coast. Mollusks were received from various localities in North America and from the Bahama Islands, Venezuela, South Australia, and the Dutch East Indies. Of insects over 37,000 specimens were acquired, including 15,000 forest insects from West Virginia, valuable material from India and Great Britain, and about 10,000 well-prepared beetles from the District of Columbia, which are intended to be used in connection with the exhibition series of the local fauna. The division of plants was enriched to the extent of 140,000 specimens. The principal addition consisted of some 80,000 specimens of grasses, transferred by the Department of Agriculture, which, with 12,800 specimens purchased during the year and the material previously in the herbarium, places the Museum in possession of the largest and most comprehensive collection of grasses in this country. Other important accessions were the Wootton collection of 10,000 plants mostly

from New Mexico, about 10,000 West Indian plants, a valuable series from British Guiana, and the C. Henry Kain collection of diatoms, one of the finest in the world, and supposed to be the largest in the United States.

The more important additions to the department of geology were illustrative of published results of investigations by the Geological Survey, comprising rocks, ores, and minerals from some of the Western States, and fossils from the middle Devonian of New York, the early Devonian and Silurian of Maine, and the Ordovician of Tennessee. Other noteworthy collections of fossil invertebrates received were from the Silurian and Devonian of the Detroit River region, the Silurian of Ohio, and the Tertiary of the Panama Canal Zone, while of vertebrate remains the accessions included a large series of mammals from the Fort Union beds of Montana, many genera and species from recently uncovered Pleistocene cave deposits in Maryland, and a small but interesting series of bones from the Yukon territory containing the first evidence of the former extension of the range of the camel on this continent beyond the Arctic Circle. The Geological Survey transmitted a large collection of Cretaceous and Tertiary plants from Colorado and New Mexico, containing 271 type and illustrated specimens. Large collections of Cambrian fossils were made by Secretary Walcott in British Columbia and Alberta in connection with his geological work in the Canadian Rockies.

NATIONAL GALLERY OF ART.

The permanent additions to the Gallery consisted of 12 paintings, 10 of which were gifts and 2 bequests. Of the former, 7 were received from Mr. William T. Evans as contributions to his notable collection of the work of contemporary American painters and are as follows: "The Meadow Brook," by Charles Paul Gruppe; "The Mourning Brave," by Edwin W. Deming; "The Fur Muff," by Robert David Gauley; "Water Lilies," by Walter Shirlaw; "Castle Creek Canyon, South Dakota," by Frank De Haven; and "Christ before Pilate" and "Suffer the Little Children to Come unto Me," by Otto W. Beck, the last two being pastels. The other gifts were "Twilight after Rain," by Norwood H. MacGilvary, presented by Mr. Frederic F. Sherman in memory of Eloise Lee Sherman; "The Wreck," by Harrington Fitzgerald, donated by the artist; and "The Lace Maker," after Terburg, contributed by Miss Julia H. Chadwick. The bequests consisted of the "Tomb of 'Mahomet the Gentleman' at Broussa," by Hamdy Bey, from Mrs. Elizabeth C. Hobson; and a portrait from the widow of the late Col. Albert B. Brackett, United States Army, by G. P. A. Healy. The additions to the loan collection comprised 18 paintings and 2 marble sculptures received from 12 friends of the Gallery.

ART TEXTILES.

The lace exhibit now embraces a fairly connected series both in respect to the varieties of laces and the development of the industry, and it also contains some important examples which from their quality and rarity form striking museum pieces. Though smaller and less conspicuous in the matter of display material than some others, it ranks high among the museum collections of the country. The work during the year was mainly in the direction of securing a more systematic arrangement of the collection and of more fully labeling both specimens and cases. The collection at present consists chiefly of loans, which have increased in number from year to year, with the expectation of soon making the collection more permanent in character.

MISCELLANEOUS.

Duplicate specimens to the number of about 7,300 were distributed to schools and colleges for teaching purposes, the subjects represented being mainly fishes, insects, marine invertebrates, rocks, ores, minerals, and fossils. Some 1,500 pounds of material suitable for blow-pipe and assay work by students was also similarly disposed of. Over 21,000 duplicates were used in making exchanges, about 85 per cent of this number being plants. Two hundred and six lots of specimens were sent to specialists for working up both on behalf of the Museum and in the interest of the advancement of researches by other institutions. They comprised over 12,700 individual specimens, besides several hundred packages of unassorted material, principally of animals, plants, and fossils.

The aggregate number of visitors to the new building on week days during the year was 261,636, a daily average of 836, and on Sundays 58,170, a daily average of 1,118. The attendance at the older Museum building was 173,858, and at the Smithsonian building 142,420, these figures representing a daily average of 555 for the former and of 455 for the latter. During inaugural week in March, 1913, the daily average for the new building was increased to 5,325 persons, the largest attendance for any single day having been 13,236 on March 5.

The publications consisted of Bulletins 79 and 81 and volumes 42 and 43 of the Proceedings, besides 105 papers issued in separate form, of which 96 belonged to the series of Proceedings and 9 to the Contributions from the National Herbarium. Thirty-five papers on Museum subjects, mainly descriptive of new additions to the collections, were also published in the Smithsonian Miscellaneous Collections. The number of copies of Museum publications distributed, including earlier issues as well as those of the year, was about 71,600.

The furnishing of the library quarters in the new building was completed early in the autumn of 1912, and the transfer of the books and equipment intended to be kept there was soon afterwards accomplished. While designed primarily to accommodate the natural history and anthropological publications, which comprise the major part of the collection, this has also been constituted the main or central library, where most of the general works of reference will be placed and where all publications will be received and catalogued. The library in the older building will hereafter be mainly restricted to the subjects of history and the arts and industries. The accessions of the year consisted of 1,690 books, 2,213 pamphlets, and 159 parts of volumes, which increased the total contents of the library to 43,692 volumes and 72,042 unbound papers of all kinds.

The facilities afforded by the new building for meetings and other functions were frequently availed of. The auditorium and committee rooms were used for the regular meetings of the Anthropological Society of Washington, the Washington Society of the Fine Arts, and the Spanish-American Athenaeum, and for a course of lectures under the Naval War College Extension. The annual meeting and semicentennial anniversary of the National Academy of Sciences were held in April. Of congresses and other assemblages which were accommodated wholly or in part in the building were the Fifteenth International Congress on Hygiene and Demography; the Ninth Triennial Congress of American Physicians and Surgeons; a joint meeting of the American Philological Association, the Archaeological Institute of America, and the Society of Biblical Literature and Exegesis; a meeting of the American Farm-Management Association; the Twentieth Annual Convention of the International Kindergarten Union; and a meeting of the General Federation of Women's Clubs. The Department of Agriculture had the use of the auditorium for annual conferences on farm management and meat inspection. Besides similar functions in connection with two of the above meetings, receptions were given by the Regents and Secretary to the members in attendance at the Eighth International Congress of Applied Chemistry and the Sixth International Congress for Testing Materials, and to the Daughters of the American Revolution. On the evening of March 6 Mr. James Wilson, late Secretary of Agriculture, was tendered a reception by the employees of the Department of Agriculture.

Respectfully submitted.

RICHARD RATHBUN,

Assistant Secretary in Charge, U. S. National Museum.

Dr. CHARLES D. WALCOTT,

Secretary of the Smithsonian Institution.

NOVEMBER 12, 1913.

APPENDIX 2.

REPORT ON THE BUREAU OF AMERICAN ETHNOLOGY.

SIR: I have the honor to submit the following report of the operations of the Bureau of American Ethnology during the fiscal year ended June 30, 1913, which have been conducted by authority of the act of Congress approved August 24, 1912, making appropriations for sundry civil expenses of the Government, and in accordance with a plan of operations approved by the Secretary of the Smithsonian Institution. The act referred to contains the following provision:

American ethnology: For continuing ethnological researches among the American Indians and the natives of Hawaii, including the excavation and preservation of archaeological remains, under the direction of the Smithsonian Institution, including salaries or compensation of all necessary employees and the purchase of necessary books and periodicals, including payment in advance for subscriptions, \$42,000.

SYSTEMATIC RESEARCHES.

The systematic researches were conducted by the regular staff of the bureau, consisting of seven ethnologists, and by other specialists not directly connected with the bureau. These operations may be summarized as follows:

Mr. F. W. Hodge, ethnologist-in-charge, was occupied almost entirely during the year with administrative affairs pertaining to the bureau's activities. He was able to devote some time to the preparation of the Bibliography of the Pueblo Indians, the writings relating to the subject covering so extended a period (from 1539 to date) and being so numerous that much remains to be done. He devoted attention also, as opportunity offered, to the revision of certain sections of the Handbook of American Indians, but as it is the desire to revise this work completely, with the aid of the entire staff of the bureau as well as of other specialists, little more than a beginning of the revision has been made. Mr. Hodge continued to represent the Smithsonian Institution at the meetings of the United States Board on Geographic Names, and the Bureau of American Ethnology on the Smithsonian advisory committee on printing and publication.

Dr. J. Walter Fewkes, ethnologist, spent the summer months and part of the autumn of 1912 in correcting the proofs of his monograph on Casa Grande and of his report on the Antiquities of the Upper Verde River and Walnut Creek Valleys, Arizona, both of which

appear in the Twenty-eighth Annual Report of the bureau, and in completing the draft of a memoir devoted to the Symbolic Designs on Hopi Pottery, which it is designed to publish with numerous illustrations. The remainder of the autumn was occupied by Dr. Fewkes in gathering material for an eventual memoir on the Culture History of the Aborigines of the Lesser Antilles, these data being derived chiefly from a study of the early literature of the subject and of the rich West Indian collections from the island of St. Vincent in the Heye Museum of New York City. Preparatory to the publication of the final results, Dr. Fewkes, with the generous permission of George G. Heye, Esq., selected with entire freedom the necessary objects for illustration, and before the close of the fiscal year about 200 drawings of the archeological objects in this important collection had been finished.

In October, 1912, Dr. Fewkes sailed for the West Indies under the joint auspices of the bureau and the Heye Museum, the special object in view being the gathering of new archeological data through the excavation of village sites and refuse-heaps and the examination of local collections in the islands. Dr. Fewkes visited Trinidad, Barbados, St. Vincent, Balliceaux, Grenada, Dominica, St. Kitts, Santa Cruz, and other islands, excavating shell-heaps in Trinidad and Balliceaux, and making archeological studies in other isles. The results of the investigations in Trinidad proved to be especially important, owing to the light which they shed on the material culture of the former aborigines of the coast adjacent to South America.

Extensive excavations were made in a large shell-heap, known as Tchip-Tchip Hill, on the shore of Erin Bay in the Cedros district. This midden is historic, for it was in Erin Bay that Columbus anchored on his third voyage, sending men ashore to fill their casks at the spring or stream near this Indian mound. Tchip-Tchip Hill is now covered with buildings to so great an extent that it was possible to conduct excavations only at its periphery; nevertheless the diggings yielded a rich and unique collection that well illustrates the culture of the natives of this part of Trinidad. The collection consists of several fine unbroken pottery vessels with painted decoration, and more than a hundred well-made effigy heads of clay, in addition to effigy jars and many broken decorated bowls. There were also obtained from the Erin Bay midden several stone hatchets characteristic of Trinidad and the adjacent coast of South America, a few shell and bone gorgets, and other artifacts illustrating the activities of the former inhabitants. It is an interesting fact that as a whole the objects here found resemble those that have been taken from shell-heaps on the Venezuela coast and from the Pomeroon district of British Guiana more closely than they resemble related specimens from the other islands of the Lesser Antilles. Several other middens

were examined in Trinidad, the most representative of which is situated near San Jose, the old Spanish capital. Promising shell-heaps were discovered also at Mayaro Bay on the eastern coast.

One of the most important results of the West Indian field work by Dr. Fewkes was a determination of the geographical distribution of certain types of artifacts and a comparison of the prehistoric culture areas in the so-called Carib Islands. Evidence of the existence of a sedentary culture on these islands preceding that of the Carib was obtained, showing it to have distantly resembled that of Porto Rico; this culture, however, was not uniform. Dr. Fewkes also found that there were a number of subcultures in these islands. In prehistoric time Trinidad and Tobago, it was determined, were somewhat similar culturally, just as they are similar geologically and biologically, to northern South America. In Dr. Fewkes's opinion perhaps nowhere is the effect of environment on human culture better illustrated than in the chain of islands extending from Grenada to Guadeloupe, which were inhabited, when discovered, by Carib, some of whose descendants are still to be found in Dominica and St. Vincent. The earlier or pre-Carib people were culturally distinct from those of Trinidad in the south, St. Kitts in the north, and Barbados in the east. The stone implements of the area are characteristic and the prehistoric pottery can readily be distinguished from that of the islands beyond the limits named.

A large number of shell-heaps on St. Vincent were visited and studies made of localities in that island in which caches of stone implements have been found. Six groups of petroglyphs were examined, even some of the best known of which have never been described. Special effort was made to obtain information respecting the origin of certain problematical objects of tufaceous stone in the Heye Museum, said to have been collected from beneath the lava beds on the flank of the Soufrière.

Dr. Fewkes visited the locality on the island of Balliceaux where the Carib of St. Vincent were settled after the Carib wars and before they were deported to Roatan on the coast of Honduras. Extensive excavations were made at the site of their former settlement at Banana Bay, where there is now a midden overgrown with brush. Here much pottery, as well as several human skeletons and some shells and animal bones, were found.

The mixed-blood survivors of the St. Vincent Carib who once lived at Morne Rond, near the Soufrière, but who are now settled at Campden Park near Kingstown, were visited. These still retain some of their old customs, as making cassava from the poisonous roots of the manihot, and preserve a few words of their native tongue. A brief vocabulary was obtained, but Carib is no longer habitually spoken in St. Vincent.

The fertile island of St. Kitts and the neighboring Nevis were found to be particularly instructive archeologically. Both have several extensive middens and well-preserved pictographs, the former having yielded many artifacts that illustrate the material culture of its pre-Carib inhabitants. Through the courtesy of Mr. Connell his large collection, which adequately illustrates the culture of St. Kitts and Nevis, was placed at the disposal of Dr. Fewkes for the purpose of study, and he was permitted to make drawings of the more typical objects, one of the most instructive of which is a sculptured torso from Nevis.

In Barbados Dr. Fewkes examined the midden at Indian River, on the west coast, from which site the important Taylor archeological collection was gathered. Several other middens were visited on the lee coast from Bridgetown to the northern end of the island, where a marly hill strewn with potsherds was observed. He also examined the so-called "Indian excavations" at Freshwater Bay and others at Indian River, and visited several cave shelters on the island. The most noteworthy of these caves are situated at Mount Gilboa and in the Scotland district, St. Lucy Parish. To one of these, known as the "Indian Castle," described in 1750 by the Rev. Griffith Hughes, who claims to have found therein an idol and other undoubted Indian objects, Dr. Fewkes devoted much attention. The gulches so characteristic of Barbados were favorite resorts of the aborigines, and, judging by the artifacts, furnished cave shelters for them. Although uninhabited at the time of its discovery, there is evidence of a considerable prehistoric aboriginal population in Barbados, whose culture was influenced largely by the character of the material from which their artifacts were made, most of them being fashioned from shell instead of stone, a characteristic seemingly constituting this island a special culture area.

A collection of stone implements, including celts, axes, and other objects, was gathered at Santa Cruz. Several local collections of archeological objects were examined, and the large midden at the mouth of Salt River was visited. The prehistoric objects obtained on this island and from St. Thomas resemble those from Porto Rico.

Although the Carib inhabitants of the Lesser Antilles are no longer of pure blood, and their language is known to only a few persons in Dominica and St. Vincent, and to these but imperfectly, it was found that the negroes, who form more than nine-tenths of the insular population, retain in modified form some traces of the material culture of the Indians. Cassava is the chief food of many of the people, and the method of its preparation has been little changed since aboriginal times. Cocoa is ground on a stone and made into cylindrical rolls in much the same manner as it was prepared by the Indians in early times. The basketry made in Do-

minica was found to be the same in style and materials as is described by the early missionaries to the Carib; while the negroes of Nevis manufacture pottery of the same form and ornament and burn it in much the same way as that found in the middens of St. Kitts. In working their spells, the obia men commonly sprinkle stone objects with the blood of a goat, and the common people regard petroglyphs as "jumbies," or bugaboos. A great number of folk tales of a mixed aboriginal and negro type are still recounted in the cabins of the lowly, where Carib names for animals, plants, and places are household words.

On his return to Washington Dr. Fewkes undertook the preparation of a report on his archeological researches in the West Indies, and considerable progress therein had been made by the close of the fiscal year.

Mr. James Mooney, ethnologist, was occupied during the greater part of the year with the investigation of Indian population, which has engaged his attention for a considerable time. This research covers the whole period from the first occupancy of the country by white people to the present time, and includes the entire territory from the Rio Grande to the Arctic. To make possible systematic treatment the area covered has been mapped into about 25 sections, each of which constitutes approximately a single geographical and historical unit for separate treatment, although numerous migrations and removals, and the frequent formation of new combinations, necessitate a constant overlapping of the work of the sections. Several of the eastern areas have been completed and more or less progress has been made with each of the others. More recently Mr. Mooney has concentrated attention on Alaska and western Canada, for the Arctic parts of which Mr. Vilhjálmur Stefánsson and Dr. Waldemar Jochelson have generously furnished new and valuable data. In this memoir the plan is to include chapters on notable epidemics, vital statistics, and race admixture, and the work is intended to appear as a monograph on the subject.

On June 18, 1913, Mr. Mooney proceeded to the Eastern Cherokee Indians in North Carolina to continue his investigations of the medical and religious ritual of that tribe, commenced a number of years ago, as it was deemed wise to finish this part of his Cherokee studies as soon as practicable by reason of the changes that are so rapidly taking place among this people. Mr. Mooney was still in the field at the close of the fiscal year.

Dr. John R. Swanton, ethnologist, continued, both in the field and at the office, his studies of the Indians formerly occupying the territory of the Southern States. He spent the month of November, 1912, with the Alabama and Koasati Indians in Polk County, Tex., where he recorded 250 pages of texts in the dialects spoken by these

two tribes, corrected several texts obtained on earlier expeditions, and added materially to his general ethnological information regarding them. In December Dr. Swanton proceeded to Oklahoma, where he obtained about 50 pages of text in Hitchiti, a language now confined to a very few persons among the Creek Indians, and collected a few notes regarding the Choctaw.

Before his departure from Washington and after his return Dr. Swanton spent the greater part of the time in collecting information concerning the Southern tribes from early Spanish, French, and English authorities. Considerable attention was also devoted to reading the proofs of the Rev. Cyrus Byington's Choctaw Dictionary, now in process of printing, in which labor he was efficiently aided by Mr. H. S. Halbert, of the Alabama State department of archives and history. Dr. Swanton also commenced a general grammatical study of the languages of the Muskhogean stock, particularly Alabama, Hitchiti, and Choctaw, and in order to further this work he was subsequently engaged in making a preliminary stem catalogue of Creek from the material recorded by the late Dr. Gatschet, similar to the catalogue already prepared for Hitchiti, Alabama, and Natchez. He began also the preparation of a card catalogue of words in Timucua, the ancient extinct language of Florida, taken from the grammar and catechisms of Father Pareja. In May, Dr. Swanton visited New York in order to examine rare Timucua works in the Buckingham Smith collection of the New York Historical Society. Through the courtesy of this society and of the New York Public Library arrangements have been made for furnishing photostat copies of these rare and important books, and the reproductions were in preparation at the close of the fiscal year.

In connection with the researches of Dr. Swanton, it is gratifying to report that he was awarded last spring the second Loubat prize in recognition of his two publications—"Tlingit Myths and Texts" and "Indian Tribes of the Lower Mississippi Valley and Adjacent Coast of the Gulf of Mexico"—both issued by the bureau.

Mrs. M. C. Stevenson, ethnologist, devoted her time to the conclusion of her researches among the Tewa Indians of New Mexico and to the preparation of a paper on that interesting and conservative people. A preliminary table of contents of the proposed memoir indicates that her studies of the customs and beliefs of the Tewa will be as comprehensive as the published results of her investigations of the Sia and the Zuñi tribe of the same State. As at present outlined, the work, which will soon be completed, will contain six sections, dealing with the following subjects, respectively: Philosophy, anthropic worship and ritual, zoic worship, social customs, material culture, and history.

Dr. Truman Michelson, ethnologist, continued his studies among the Algonquian tribes. In the middle of July, 1912, he proceeded to the Fox Indians, at Tama, Iowa, from whom a large additional body of mythological material was obtained; this, in connection with the myths and legends in the form of texts gathered during the previous season, approximates 7,000 pages. When the translation of this material shall have been finished it will form one of the most exhaustive collections of mythology of any Indian tribe. It is noteworthy that these myths and tales differ essentially in style from those gathered by the late Dr. William Jones (scarcely any of whose material has been duplicated by Dr. Michelson), a fact that emphasizes the necessity of recording such material in the aboriginal tongue. It may be added that the myths and tales collected are also important in the light they shed on the dissemination of myths. Study of the social and ceremonial organization of the Fox Indians was likewise continued, and especially full notes were obtained on their Religion dance. Many of the songs of one of the drums were recorded on a dictaphone and several photographs of the native ball game were secured.

Dr. Michelson next proceeded to Haskell Institute, the nonreservation Indian school at Lawrence, Kans., for the purpose of obtaining notes on Atsina (Gros Ventre) and several other Algonquian languages, the results of which show definitely that Atsina shares with Arapaho all the deviations from normal Algonquian, and that Potawatomi is further removed from Ojibwa, Ottawa, and Algonkin than any one of these is from the others.

Dr. Michelson next visited the Munsee, in Kansas, but found that, unfortunately, little is now available in the way of information except as to their language, which is still spoken by about half a dozen individuals, though none employ it habitually.

The Delawares of Oklahoma were next visited, Dr. Michelson finding that their aboriginal customs are still retained to a large extent. Extended observations were made on several dances, and, to a lesser extent, on the social organization. From a study of the Delaware language, together with the Munsee dialect of Kansas, it was ascertained, as had previously been surmised, that the Delaware language of the early Moravian missionary Zeisberger represents no single dialect but a medley of several dialects.

On his way to Washington Dr. Michelson stopped again at Tama to obtain additional notes on the Fox Indians; at the same time he succeeded in arranging for the acquirement of certain sacred packs for the National Museum. He also visited Chicago and New York for the purpose of making comparative observations on the material culture of the Fox tribe, based on collections in the museums of those cities.

On his arrival in Washington, at the close of December, Dr. Michelson undertook the translation and study of some of the Fox myths; the results indicate that very great firmness in the word unit in Algonquian is more apparent than real, and that the classification of stems must be revised. Dr. Michelson also brought to conclusion his translation of the Kickapoo myths and tales collected by the late Dr. Jones, to which were added notes on Kickapoo grammar and comparative notes on the myths and tales, the whole making somewhat more than 300 pages.

Through correspondence Dr. Michelson succeeded in arranging for the acquirement of other sacred packs of the Fox Indians, which have been deposited in the National Museum. He also aided in furnishing information in answer to inquiries by various correspondents, and from time to time supplied data for incorporation in a new edition of the Handbook of American Indians.

From the investigations of the bureau it seemed that the Siouan and Muskogean languages resembled each other morphologically. In view of these circumstances, it was deemed desirable that the Catawba, one of the Siouan tongues, should be restudied, and accordingly, toward the close of May, 1913, Dr. Michelson proceeded to South Carolina, where the remnant of the Catawba tribe still reside. Unfortunately, it was found that the language is all but extinct, not even half a dozen persons being able to recall phrases, although isolated words can still be had in goodly number. Owing to this paucity of text material it is hardly likely that the grammar of Catawba will ever be completely elucidated, and as no comparative study with other Siouan dialects has yet been made, it is not practicable at present to say with which Siouan group the language is most closely associated. A considerable number of native songs are still remembered by the surviving Catawba, nearly all of which Dr. Michelson succeeded in recording by dictaphone.

Mr. J. N. B. Hewitt, ethnologist, was occupied during the year in translating unedited Seneca texts of myths which were collected by himself in 1896 and at other times on the Cattaraugus Reservation in western New York and on the Grand River Reservation in Ontario, Canada. These myths, legends, and tales number 13 in all. In addition, Mr. Hewitt undertook the editing of two Seneca texts—"The Legend of S'hagowē'not'hă", or The Spirit of the Tides," and "The Tale of Doă'danégēn" and Hotkwisdadegēn'ă"—recorded by himself in the form of field notes in 1896 and aggregating 95 typewritten pages. At the close of the fiscal year about one-third of this work was completed. To these texts interlinear translations are to be added for the purpose of aiding in the grammatic study of the Seneca tongue.

Mr. Hewitt also devoted much time to the collection and preparation of data for answers to correspondents of the bureau, especially with reference to the Iroquoian and Algonquian tribes.

Mr. Francis La Flesche, ethnologist, continued his investigations of the ethnology of the Osage Indians, giving particular attention to their rituals and accompanying songs. He was enabled to record on the dictaphone the songs and fragments of the rituals belonging to the Waxobe degree of the Noⁿ'hoⁿzhiⁿga rites, of which, as noted in the last annual report, he has been making a special study. These rituals have been transcribed and, with the 84 songs that have been transcribed in musical notation by Miss Alice C. Fletcher, comprise 66 typewritten pages.

Mr. La Flesche has also been able to record the Noⁿ'zhiⁿzhoⁿ, or Fasting degree, of the Puma and Black Bear gentes. These two organizations are closely related; they not only use in common the songs and rituals of the Noⁿ'hoⁿzhiⁿga rites, but they even go to the extent of exchanging gentile personal names as full recognition of their relationship. The Noⁿ'zhiⁿzhoⁿ degree employs 12 rituals and numerous songs, of which latter 81 have been recorded. These songs are divided into two great groups, the first of which is known as "The Seven Songs," having 16 sets, and the second, "The Six Songs," having 17 sets. The Osage texts of these rituals and songs cover 207 pages, about three-fourths of which have been finally typewritten. The 81 songs have been transcribed in musical notation by Miss Fletcher, while the translation of the rituals and the words of the songs is in progress.

In the autumn of 1912 Mr. La Flesche was fortunate in securing in full the Ni^k'i degree of these intricate Osage rites. Hitherto he had been able to obtain only the beginning of this degree, but his informant was finally induced to recite it in its entirety, comprising 1,542 lines. The real title of this degree is Ni^k'i Noⁿk'oⁿ, "The Hearing of the Words of the People." In it the genesis of the tribe is given in a story made up of myth, legend, and symbolism, the whole being clearly devised to keep the people ever mindful of the necessity of an orderly and authoritative conduct of war. It goes to show that the principle of war was early recognized by the Osage as the surest means by which not only tribal and individual life might be safeguarded against strange and hostile tribes, but also as the means by which the tranquil enjoyment of game and other natural products of their environment might be won. It is to this coveted tranquillity that the closing lines of many of the rituals refer, invariably likening it to a "serene day." This degree employs ritual almost entirely, there being only 10 songs. The native ritual comprises 57 typewritten pages, of which a large part has been translated.

In the spring of 1913 Mr. La Flesche obtained the Rush Mat Weaving degree of the Puma and Black Bear gentes. Only the "Seven Songs" spoken of before, with various ceremonial forms, are employed in this degree, the "Six Songs" being entirely omitted. The distinguishing features are the ceremonial weaving of the rush mat for the sacred case in which were enshrined the bird and other sacred objects, the renewal of all the articles that make up the sacred bundle, and the ceremonial stitching of the ends of the case. In some respects this is one of the most extraordinary degrees of the Osage that Mr. La Flesche has yet observed, since in its performance there are used 70 brass kettles, 70 red-handled knives, and 70 awls in making the various articles, all of which the votary is obliged to furnish, together with other expensive articles that constitute the fees of the initiator and other officiating Noⁿ'hoⁿzhiⁿga, as also 70 pieces of choice jerked meat for distribution among the members attending the initiation. Three rituals not used in the other degrees are employed in this, namely, the Green Rush ritual, the Bark ritual, and the Stitching and Cutting ritual. There are 61 pages of Osage text, about half of which have been transcribed.

Mr. La Flesche also obtained the rituals and songs of the Washabe Athiⁿ, "The Carrying of a Dark Object," with full description of the various processions and ceremonial forms. This is a war ceremony, which, although not counted as a degree, is a rite to which the seven degrees lead. The name of this ceremony is derived from the war insignia, which is the charcoal ceremonially prepared from certain sacred trees, and which symbolizes the black marks denoting the birds and animals used to typify strength, courage, and fleetness. Mr. La Flesche's Osage informant regards this as the final act of the seven degrees. The Osage text comprises 90 pages, nearly one-half of which has been transcribed, together with 36 songs, which have been transcribed by Miss Fletcher, and 7 diagrams.

Mr. La Flesche was fortunate enough to procure the sacred bundle of the Deer gens and the reed-whistle bundle of the Wind gens; the contents of the latter are of exceptional interest. Mrs. Brogahige, one of the ceremonial weavers of the Osage, at considerable sacrifice to herself, presented Mr. La Flesche two sacred looms, one of which is used in weaving the buffalo-hair case, and the other in weaving the rush case for the sacred bird. These packs, together with specimens of ceremonially made burden straps which Mr. La Flesche collected, have been placed in the National Museum.

Dr. Franz Boas, honorary philologist, continued the preparation of the material for the Handbook of American Indian Languages. As stated in the last annual report, the manuscript of the grammar of the Chukchee language, to appear in Part 2 of this handbook, was

completed and in its final form was discussed with the author, Mr. Waldemar Bogoras, during the visit of Dr. Boas to Berlin in the summer of 1912. The results of these discussions were embodied in the work, the manuscript was delivered, and the typesetting commenced. At the same time Dr. Boas studied the Koryak texts collected by Mr. Bogoras, published in accordance with the plan previously outlined, at the expense of the American Ethnological Society, and the indispensable references were embodied in the grammatical sketch.

The Coos grammar by Dr. Leo J. Frachtenberg was completed, so far as the work of the editor, Dr. Boas, is concerned, the page proofs having been finally revised.

The manuscript for the Siuslaw grammar, also by Dr. Frachtenberg, was submitted and the editing considerably advanced; this will be completed as soon as the entire series of Siuslaw texts are in print, a work that has been undertaken under Dr. Boas's editorship by Columbia University. All the collected texts are now in type, so that examples can be added to the manuscript of the grammar.

Dr. Frachtenberg remained in Siletz, Oreg., throughout the year for the purpose of revising on the spot the materials on the Oregon languages. He was engaged in collecting and arranging the Alsea material for Part 2 of the Handbook of Languages, and in preparing for the discussion of his Molala linguistics. The rapid disappearance of the Calapooya may make it necessary, however, to complete the field work on the language of this people before closing the work on the other manuscripts, even though this procedure may entail delay in the printing of the volume.

Dr. Alexander F. Chamberlain, of Clark University, who has undertaken the preparation of a grammar of the Kutenai language, expects to deliver his manuscript early in the new fiscal year. The printing of this sketch must necessarily be delayed until the text material is available in print.

Miss Haessler continued her preparations for a careful revision of the Dakota Dictionary by Riggs, a work made necessary by reason of the need of greater precision in phonetics and translation, as well as of a more systematic arrangement of the material. Miss Haessler expects to complete all the preliminary work by the summer of 1914, so that, should facilities be available, she will then be able to undertake the required field work.

Miss Frances Densmore continued her studies in Indian music, devoting special attention to that of the Sioux, and during the year submitted three papers, comprising 252 pages of manuscript, original phonographic records and musical transcription of 107 songs, and 23 original photographic illustrations. Three subjects have been ex-

haustively studied and a fourth is represented in such manner that the results may be regarded as ready for publication. The three principal subjects are: The sacred stones, dreams about animals, and the buffalo hunt. The fourth subject referred to relates to the war-path and is represented by about 20 songs, but it awaits further study of the military societies. A special group of songs consists of those which have been composed and sung by the Sioux in honor of Miss Densmore.

A study of the music of the Mandan and Hidatsa at Fort Berthold, N. Dak., was made by Miss Densmore in the summer of 1912, in cooperation with the Historical Society of the State of North Dakota. The results of this investigation consist of a manuscript of about 50 pages, with transcriptions of 40 songs.

Miss Densmore also read the proofs of Bulletin 53 (Chippewa Music—II), which is now in press.

Mr. W. H. Holmes, head curator of the department of anthropology of the United States National Museum, continued the preparation of the Handbook of American Archeology for publication by the bureau, as far as the limited time available for the purpose permitted. Aside from the preparation of the text and illustrations for parts 1 and 2 of this handbook, Mr. Holmes made field observations among the ancient mica mines in western North Carolina and among mounds and village sites in South Carolina and Georgia. He also visited a number of museums for the purpose of examining the collections of archeological material, among them being the museums of Boston, Andover, New York City, Philadelphia, Columbus, Chicago, Milwaukee, Madison, Davenport, and St. Louis.

Mr. D. I. Bushnell, jr., made good progress in the compilation of the Handbook of Aboriginal Remains East of the Mississippi, the manuscript material for which, recorded on cards, now approximates 160,000 words. The collated material has been derived from (1) replies to circular letters addressed to county clerks in all of the States east of the Mississippi, (2) communications from various societies and individuals, and (3) publications pertaining to the subject of American antiquities. It is gratifying to state that there are very few areas not covered by the material already in hand, and it is expected that through the systematic manner in which Mr. Bushnell is prosecuting the work the handbook will be as complete as it is practicable to make it by the time it is ready for publication.

The investigations conducted jointly in 1910 and 1911 by the bureau and the School of American Archæology have borne additional fruit. An extended memoir on the Ethnogeography of the Tewa Indians, by J. P. Harrington, was received and will appear as the

"accompanying paper" of the Twenty-ninth Annual Report, now in press. Three bulletins, namely, (No. 54) *The Physiography of the Rio Grande Valley, New Mexico, in Relation to Pueblo Culture*, by Edgar L. Hewett, Junius Henderson, and W. W. Robbins; (No. 55) *The Ethnobotany of the Tewa Indians*, by Barbara W. Freire-Marreco, W. W. Robbins, and J. P. Harrington; and (No. 56) *The Ethnozoology of the Tewa Indians*, by Junius Henderson and J. P. Harrington, were also presented as a part of the results of the joint expeditions and are either published or in process of printing. Mr. Harrington also made progress in the preparation of his report on the Mohave Indians, and Miss Freire-Marreco is expected to submit shortly an extended paper on the Yavapai tribe. There remains to be mentioned in this connection another memoir, namely, *An Introduction to the Study of the Maya Hieroglyphs*, by Sylvanus G. Morley; while not a direct product of the joint work of the bureau and the school, this is in a measure an outgrowth of it. The manuscript, together with the accompanying illustrations, has been submitted to the bureau, but is now temporarily in the author's hands for slight revision.

Since the publication of the *Handbook of American Indians*, through which additional popular interest in our aborigines has been aroused, it has been the desire to make a beginning toward the preparation of a series of handbooks devoted to the Indians of the respective States. The opportunity was fortunately presented toward the close of the fiscal year, when the bureau was enabled to enlist the aid of Dr. A. L. Kroeber, of the University of California, who has kindly consented to undertake the preparation of the initial volume of the series, to be devoted to the Indians of California. It is planned to present the material in each volume in as popular a form as practicable, in order that it may be made of the greatest use to schools, and it is hoped that the means may be soon available to make possible the extension of the series to other States.

Under a small allotment from the bureau, Mr. James Murie continued his studies of Pawnee ceremonies. He devoted special attention to the medicine rites, and on June 13, 1913, submitted a description of the ritual pertaining to the "Purification of the Buffalo Skull".

The transcription of the manuscript *French-Miami Dictionary* in the John Carter Brown Library at Providence, R. I., to which attention has been directed in previous reports, was finished by Miss Margaret Bingham Stillwell, who submitted the last pages of the vocabulary (which number 1,120 in all) early in January, 1913. The bureau is under obligations to Mr. George Parker Winship, librarian of the John Carter Brown Library, for his generous cooperation in placing this valued document at the disposal of the

bureau and to Miss Stillwell for the efficient manner in which this difficult task was accomplished.

In the latter part of the fiscal year Mr. Jacob P. Dunn, of Indianapolis, in whose hands the French-Miami Dictionary was placed for study, commenced the annotation of the transcription and the addition of English equivalents. This necessitated a journey to Oklahoma, where Mr. Dunn enlisted the services of a Miami Indian as an interpreter. The result of these studies consists of (a) the French-Miami-English Dictionary, from *Abbaïser* to *Cajoux*; (b) The History of Genesis, Chapter I, being Peoria text with Miami-English translation; (c) English-Miami Dictionary, from *Abandon* to *Aim*; (d) Wissakatckwa Stories, recorded in Peoria by the late Dr. Gatschet, for which Mr. Dunn has made an interlinear translation.

The compilation of the List of Works Relating to Hawaii was continued by Prof. Howard M. Ballou, of the College of Hawaii, who from time to time has submitted additional titles. The recording of the material by more than one person necessarily resulted in more or less inconsistency in form; consequently the manuscript, which consists of many thousands of cards, has been in need of editorial revision in order to insure uniformity. For this revision the bureau has been fortunate in enlisting the services of Mr. Felix Neumann, an experienced bibliographer, who is making progress in the work.

PUBLICATIONS.

The editorial work of the bureau has been conducted as usual by Mr. J. G. Gurley, editor. The following publications were issued during the year:

Twenty-eighth Annual Report, containing "accompanying papers" as follows: (1) Casa Grande, by Jesse Walter Fewkes; (2) Antiquities of the Upper Verde River and Walnut Creek Valleys, Arizona, by Jesse Walter Fewkes; (3) Preliminary Report on the Linguistic Classification of Algonquian Tribes, by Truman Michelson.

Bulletin 30, Handbook of American Indians North of Mexico, edited by Frederick Webb Hodge. By concurrent resolution of Congress, in August, 1912, a reprint of this bulletin was ordered in an edition of 6,500 copies, of which 4,000 were for the use of the House of Representatives, 2,000 for the use of the Senate, and 500 for the use of the bureau. This reprint, in which were incorporated such desirable alterations as could be conveniently made without affecting the pagination of the work, was issued in January, 1913.

Bulletin 52, Early Man in South America, by Aleš Hrdlička, in collaboration with William H. Holmes, Bailey Willis, Fred. Eugene Wright, and Clarence N. Fenner.

Bulletin 54, The Physiography of the Rio Grande Valley, New Mexico, in Relation to Pueblo Culture, by Edgar Lee Hewett, Junius Henderson, and Wilfred William Robbins.

The work on the other publications during the year may be summarized as follows:

Twenty-ninth Annual Report ("accompanying paper," The Ethnogeography of the Tewa Indians, by John Peabody Harrington). Manuscript prepared for the printers and nearly half of the composition finished.

Thirtieth Annual Report ("accompanying papers": (1) Animism and Folklore of the Guiana Indians, by Walter E. Roth; (2) Tsimshian Mythology, by Franz Boas; (3) Ethnobotany of the Zuni Indians, by Matilda Coxe Stevenson). Editing of the third paper and to a considerable extent that of the first paper completed.

Bulletin 40, Handbook of American Indian Languages, by Franz Boas—Part 2. Work on the Coos section nearly finished and composition of the Chukchee section begun. Two sections (Takelma and Coos) are now "made up," aggregating 429 pages.

Bulletin 46, A Dictionary of the Choctaw Language, by Cyrus Byington, edited by John R. Swanton and H. S. Halbert. The editors have revised two galley proofs of the Choctaw-English section of this dictionary and have practically finished preparation for the printers of the English-Choctaw section. The first part of this bulletin is now in process of paging.

Bulletin 53, Chippewa Music—II, by Frances Densmore. Manuscript edited and the several proofs read, including proofs of 180 pieces of music. At the end of the year the bulletin was held in the Printing Office awaiting receipt of the necessary paper stock.

Bulletin 55, Ethnobotany of the Tewa Indians, by Barbara Whitchurch Freire-Marreco, Wilfred William Robbins, and John Peabody Harrington. Manuscript edited and the work in galley form at the close of the year.

Bulletin 56, Ethnozoology of the Tewa Indians, by Junius Henderson and John Peabody Harrington. Manuscript edited and the work in page form at the close of the year.

In accordance with the act of Congress approved August 23, 1912, the entire stock of publications of the bureau, with the exception of a few copies of each available work which have been retained at the Smithsonian Institution for special purposes, was transferred to the Government Printing Office in October, 1912, for distribution from the office of the superintendent of documents on order from the bureau. It has been found that this plan of distribution is highly successful, and, of course, much less expensive to the bureau.

The correspondence relating to publications, of which 15,070 were distributed during the year, was conducted under the immediate

supervision of Miss Helen Munroe, of the Smithsonian Institution. The distribution of the publications may be summarized as follows:

Series:	Copies.
Report volumes and separate papers-----	3, 895
Bulletins -----	11, 040
Contributions to North American Ethnology-----	15
Introductions -----	7
Miscellaneous publications-----	113
	<hr/> 15, 070

The demand for the Handbook of American Indians (Bulletin 30) continues unabated, by reason of the wide scope of the work, its popular form of treatment, and its usefulness to schools. There is an increasing demand for publications relating to Indian arts and crafts, and to archeology. The activity in the establishment of organizations of Camp Fire Girls throughout the country has resulted in a flood of requests for information relative to Indian customs, names, etc.

ILLUSTRATIONS.

As in the past, the preparation of illustrations for use in connection with the publications of the bureau, as well as the making of photographic portraits of the members of visiting deputations of Indians, continued in the immediate charge of Mr. De Lancey Gill, illustrator, whose work during the year included the making of negatives of 113 visiting Indians and of 93 miscellaneous ethnologic subjects; he also developed 298 negatives exposed by members of the bureau in their field work, printed 975 photographs for official publication, exchange, and presentation to Indians, and prepared 105 drawings for reproduction as illustrations for the publications of the bureau.

The tribes or pueblos represented by Indians who visited Washington during the year are: Acoma, Apache, Cheyenne, Chippewa, Cochiti, Crow, Isleta, Kiowa, Osage, Passamaquoddy, Ponca, San Juan, Santa Clara, Shoshoni, Sioux, Taos, and Wichita. Among the more important Indians whose portraits were made may be mentioned Plenty Coups and Medicine Crow (Crow tribe), Big Man and Iron Bear (Brulé Sioux), Hollow Horn Bear, Red Cloud, and Red Hawk (Teton Sioux), Daybwawaindung (Chippewa), and Two Moons (Cheyenne). Many requests are made by correspondents for prints from the large collection of negatives in possession of the bureau, but it has not been possible to supply these, owing to lack of means, although in many cases they are desired for educational purposes. The series of photographs of representative Indians, from 55 tribes, which was made during the last fiscal year for special exhibition at the New York Public Library, has been borrowed from the bureau by the Public Library Commission of Indiana for exhibition in the public libraries throughout the State. In the work of the

photographic laboratory Mr. Gill was assisted by Mr. Walter J. Stenhouse.

LIBRARY.

The library of the bureau continued in immediate charge of Miss Ella Leary, librarian, assisted by Mrs. Ella Slaughter. During the year the accessions comprised 562 volumes (of which 129 were purchased) and 244 pamphlets, bringing the total number of volumes in the library to 18,532, and the pamphlets to 12,744. The periodicals currently received by the bureau, of which there are several thousand unbound parts, number 629; of these all but 18 are obtained in exchange for the bureau's publications. Special attention was paid during the year to filling lacunæ in the periodical series.

The cataloguing kept apace with the new accessions, and some progress was made in cataloguing ethnologic and related articles in the earlier serials. A monthly bulletin for the use of the members of the bureau staff was compiled and posted by the librarian, who also made a beginning in the preparation of a list of writings on the music of American Indians.

As in the past, it was necessary to draw on the collections of the Library of Congress, about 300 volumes having been borrowed during the year. On the other hand, the library of the bureau is frequently consulted by officers of the departments of the Government, as well as by students not connected with the Smithsonian Institution.

While many volumes are still without binding, the condition of the library in this respect has greatly improved during the last few years; 493 volumes were bound at the Government Printing Office during the year.

COLLECTIONS.

The following collections were made by the bureau or by members of its staff during the fiscal year and transferred to the National Museum:

- 54311. Six photographs (unmounted) taken by A. J. Horswill, San Jose, Mindoro, P. I., among the natives of Mindoro Island. Gift to the bureau by Munn & Co., New York.
- 54465. Sacred pack of the Fox Indians of Iowa. Purchased for the bureau by Dr. Truman Michelson.
- 54691. Five pieces of cotton painted with Assyrian subjects. Received by the bureau from an unknown source.
- 54798. Three sacred looms and seven burden straps of the Osage Indians. Collected by Francis La Flesche.
- 54933. Three fragments of Indian pottery found at Red Willow, Nebr., by Mrs. Ada Buck Martin, by whom they were presented.
- 54934. Sacred bundle of the Fox Indians. Purchased through Dr. Truman Michelson.

54946. Two sacred bundles of the Osage Indians. Purchased by Francis La Flesche.
55002. Sacred bundle of the Fox Indians. Purchased through Dr. Truman Michelson.
55075. An Osage buffalo-hair rope (reata) and an Osage woven belt. Purchased through Francis La Flesche.
55234. Two ethnological objects from the natives of British Guiana, presented to the bureau by Dr. Walter E. Roth, of Pomeroon River, British Guiana.
55323. Set of five plum-seed gaming dice of the Omaha Indians and a bottle of seeds used by the same Indians as perfume. Presented by Francis La Flesche.
55420. Pair of Osage ceremonial moccasins and an Osage ceremonial "pipe." Presented by Francis La Flesche.

PROPERTY.

As stated in previous reports, the property of the bureau of greatest value consists of its library, manuscripts for reference or publication, and photographic negatives. A reasonable number of cameras, dictagraphs, and other apparatus, chiefly for use in the field, as well as a limited stock of stationery and office supplies, necessary office furniture, and equipment, are also in possession of the bureau. The sum of \$893.21 was expended for office furniture (including fire-proof filing cases) during the year, \$452.57 for apparatus (including typewriters, cameras, dictagraphs, etc.), and \$258.45 for books and periodicals.

The manuscripts of the bureau, many of which are of extreme value, are deposited in metal cases in a small room in the north tower of the Smithsonian Building, which should be made as nearly fireproof as possible. Requests for a small appropriation to protect the manuscripts against possible destruction have been made in the past, but unfortunately the means have not been granted. The manuscripts, which have been in the immediate care of Mr. J. N. B. Hewitt, have increased from time to time during the year, chiefly by the temporary deposit of materials preparatory to editing for publication. Mention may here be made, however, of the gift of some manuscript Chippewa letters from the Rev. Joseph A. Gilfillan, and the acquirement of a photostat copy of the Motul-Maya Dictionary, made at the expense of the bureau from the original in the John Carter Brown Library, at Providence, R. I., as elsewhere noted. Mention may also be made of various vocabularies or parts of vocabularies, 23 items in all, which were restored to the bureau by Mrs. Louisa H. Gatschet, who found them among Dr. Gatschet's effects.

MISCELLANEOUS.

Quarters.—Since the beginning of 1910 the offices of the bureau have occupied nine rooms in the north tower of the Smithsonian Building, and a room (the office of the ethnologist-in-charge) on the

north side of the third floor of the eastern wing; while the library has occupied the entire eastern gallery of the large exhibition hall on the first floor, and the photographic laboratory part of the gallery in the southeastern section of the old National Museum building. While the natural lighting of the rooms in the north tower, by reason of the thickness of the walls and the narrowness of the windows, is inadequate, and the distance from the library and the photographic laboratory makes them not readily accessible, the office facilities are far better than when the bureau was housed in cramped rented quarters. Aside from the photographic laboratory and one room in the north tower, no part of the bureau's quarters is provided with running water. It is presumed that after the rearrangement of the large exhibition hall in the Smithsonian building and its adaptation to general library purposes the facilities of the bureau library will be greatly improved.

Office force.—The office force of the bureau has not been augmented, although the correspondence has greatly increased owing to the growing demand on the bureau for information respecting the Indians. The copying of the rough manuscripts, field notes, etc., prepared by members of the bureau, as well as the verification of quotations, bibliographic citations, and similar work of a minor editorial nature, necessitate the employment of temporary aid from time to time. Most of the answers to correspondents who desire information of a special character have been prepared by the ethnologist-in-charge, but every member of the bureau's scientific staff is frequently called on for the same purpose to furnish information pertaining to his particular field of knowledge.

RECOMMENDATIONS.

It is difficult to extend the systematic researches of the bureau along new and necessary lines without an increase of appropriations. When a special research is undertaken, several years are often required to finish it, consequently the prospective income of the bureau for a considerable period is required to carry out adequately the work in hand. Opportunities are often presented for conducting investigations in new fields which have to be neglected owing to lack of means. An increase in the appropriations of the bureau has been urged for several years, but unfortunately the estimates have not been met with additional funds.

Respectfully submitted.

F. W. HODGE,
Ethnologist-in-charge.

Dr. CHARLES D. WALCOTT,
*Secretary of the Smithsonian Institution,
Washington, D. C.*

APPENDIX 3.

REPORT ON THE INTERNATIONAL EXCHANGES.

SIR: I have the honor to submit the following report on the operations of the International Exchange Service during the fiscal year ending June 30, 1913.

The appropriation made by Congress for the support of the service during the year, including the allotment for printing and binding, was \$32,200 (the same amount as appropriated for the past five years), and the repayments from private and departmental sources for services rendered aggregated \$4,249.13, making the total available resources for carrying on the system of international exchanges \$36,449.13.

The work of the service is increasing at such a rapid rate that it will be necessary in the near future to ask Congress to supply additional funds. More money is needed to meet freight charges on the increased number of boxes now shipped abroad, and also for miscellaneous incidental expenses incurred in connection with the work of the service. In 1913, 66 per cent more packages were handled than in 1908, when the appropriation was first placed at \$32,200, and 678 more boxes were dispatched. By means of various economies and improvements in methods this increase in the volume of business has been provided for without adding to the total cost of the service; but little more can be done in this direction.

During the year 1913 the total number of packages handled was 338,621, an increase of 23,129, as compared with the preceding year. The weight of these packages was 593,969 pounds, an increase of 25,257 pounds.

The number and weight of the packages of different classes are indicated in the following table:

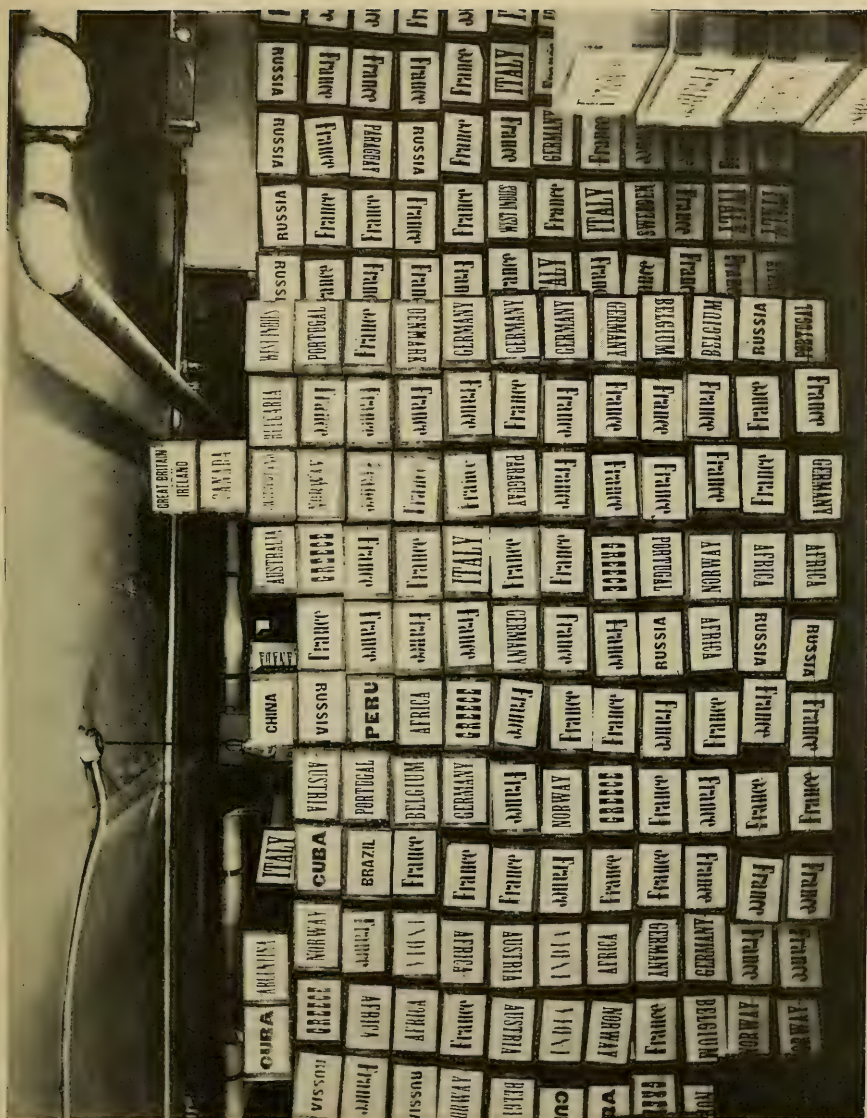
Number and weight of packages sent and received.

	Packages.		Weight.	
	Sent.	Received.	Sent.	Received.
			<i>Pounds.</i>	<i>Pounds.</i>
United States parliamentary documents sent abroad.....	140,345	.....	103,820	.....
Publications received in return for parliamentary documents.....		2,085	.....	11,780
United States departmental documents sent abroad.....	78,937	.....	173,962	.....
Publications received in return for departmental documents.....		9,923	.....	18,847
Miscellaneous scientific and literary publications sent abroad.....	62,446	.....	158,227	.....
Miscellaneous scientific and literary publications received from abroad for distribution in the United States.....		44,885	.....	127,333
Total.....	281,728	56,893	436,009	157,960
Grand total.....	338,621		593,969	

As was somewhat fully explained in last year's report, the disparity between the number of packages dispatched and those received in behalf of the Government is not so great as indicated by these figures. Packages sent abroad usually contain only a single publication each, while those received in return often comprise many volumes. In the case of publications received in exchange for parliamentary documents and some others the term "package" is applied to large boxes containing a hundred or more publications. No lists of these are made in the Exchange Office, as the boxes are forwarded to their destinations unopened. It is also a fact that many returns for publications sent abroad reach their destinations direct by mail and not through the Exchange Service.

Many governmental and scientific establishments and individuals, both in this country and abroad, have sought the aid of the International Exchange Service during the year in procuring, as gifts or exchanges, certain especially desired publications. The correspondence which this work entails upon the Exchange Service is considerable and is growing in volume from year to year. Sometimes information collected by this Government, but not to be found in published reports, is requested. In these instances the various governmental bureaus furnish the desired data in typewritten form. As an example of a request of this kind received during the year, a case may be mentioned in which valuable statistics concerning blister copper were supplied by the Bureau of the Census and the Bureau of Mines for transmission to the high commissioner of the Commonwealth of Australia for the use of his home Government. Another request of this character which was complied with was one received through the Department of State from the minister of public works and mines of New Zealand for publications containing the laws and regulations with respect to the boring, mining, and storage of petroleum in the United States. In this instance, while the Bureau of Mines was in a position to furnish information on the mining of petroleum on Indian reservations, it was necessary for the Institution to write to the principal States having laws on the subject in question in order to obtain the desired data. It may, however, be added in this connection that the Bureau of Mines is engaged in collecting, arranging, and annotating all the laws, both National and State, relating to all branches of mining, including the petroleum industry, and that a copy of this work, when issued, will be furnished the Institution for presentation to the minister of public works.

The Department of State, in referring a communication from the librarian of the Brazilian Press Association at Rio de Janeiro requesting aid in the establishment of a library in that city to be composed entirely of the works of American writers, stated that while the department itself had no facilities for obtaining such publications it



PHOTOGRAPH OF PORTION OF 2,000 PACKAGES OF THE EIGHTH INTERNATIONAL CONGRESS OF APPLIED CHEMISTRY RECEIVED BY THE EXCHANGE SERVICE FOR DISTRIBUTION ABROAD.

was naturally interested in having the more important works of American writers, as well as the governmental documents containing statistical information, placed within easy reach of our neighbors in the Latin-American countries, and that it would be gratifying to the department if the Smithsonian Institution should find it practicable to send to the association such works and statistics regarding science, literature, agriculture, industry, commerce, etc., as might seem suitable. The desire of the Brazilian Press Association was brought to the attention of certain governmental establishments and also of many scientific and literary organizations throughout the United States. The majority of these organizations gave the matter favorable attention, some of them sending complete sets of their publications and adding the name of the American library to their lists to receive future issues. The Smithsonian Institution, I need hardly add, contributed a selection of its own publications. Altogether, more than 1,200 publications were received and transmitted to the Brazilian Press Association through the International Exchange Service as a nucleus for the proposed library.

The chief of the bureau of publications of the Department of Agriculture and Forestry, Peking, China, while attending the Seventeenth International Dry Farming Congress as a delegate from his Government, forwarded to this Institution, for distribution among the various State agricultural experiment stations, a number of copies of three issues of an agricultural journal published by his bureau, with the request that such bulletins as the experiment stations might issue from time to time be sent to his bureau in exchange. This matter was brought to the attention of the various stations, most of which complied with the request by sending copies of their bulletins and listing the name of the Chinese Department of Agriculture to receive their publications regularly in the future.

Many requests for documents are received through the various exchange bureaus abroad, whose services are made use of by this Institution in procuring foreign publications for correspondents in this country. In this connection it may be mentioned that the Government of India invariably requires that requests from establishments in this country for any extended series of Indian official documents be made through the Exchange Service. In such instances the status of the society or establishment making the request is looked into, and statistics and other information relative thereto are furnished the Government of India with a recommendation, when deemed advisable, that the desired documents be furnished.

The foregoing are only a few of the important instances in which the Institution has aided foreign establishments in obtaining publications, in pursuance of a policy of international helpfulness, which is of benefit to the larger intellectual and economic interests of both

the United States and foreign countries. Many other requests of similar nature have been received from correspondents in this country and abroad.

The Institution continues to assist the Library of Congress in completing its collections of foreign governmental documents.

Mention was made last year of the fact that packages containing scientific and literary publications received from establishments and individuals in the United States for transmission through the Exchange Service to miscellaneous addresses in the various Provinces of the Union of South Africa were forwarded to certain governmental establishments in those Provinces for distribution, and that the Government of the Union had been approached with a view to having only one agency for the entire Union. It is now gratifying to state that this request has been complied with, the Government Printing Works at Pretoria having been designated to carry on the exchange work. Packages received in the future for addresses in any of the Provinces of the Union will therefore be transmitted to the Government Printing Works for distribution. This change will effect a saving to the Institution in freight charges, and will also, I have no doubt, improve the service with South Africa. If a similar arrangement could be made with the Commonwealth of Australia it would have decided advantages over the present method of forwarding consignments to six different addresses in that Commonwealth for distribution. The matter is now being considered by the Speaker of the House of Representatives of the Commonwealth of Australia, who is also chairman of the library committee. The Institution has brought to the attention of that official the advantages to be derived from having one central exchange agency in Australia and has urged him to use his best endeavors to have the matter favorably considered by his Government.

The Egyptian Exchange Agency has been transferred from the Egyptian Survey Department to the newly formed Government Publications Department, consignments for distribution in that country now being forwarded in care of the Superintendent of the Government Publications Office, Printing Department, Cairo. It should be stated as a matter of record in this connection that the businesslike basis upon which the exchange service between Egypt and the United States has been placed during the Survey Department's five years' connection therewith has resulted in the prompt delivery of packages to correspondents in both countries.

A circular was received during the year from the Republic of Mexico, stating that a Service of Exchanges had been established in the Department of Public Works.

Of the 2,587 boxes used in forwarding exchanges to foreign bureaus and agencies for distribution (an increase of 192 over 1912),

386 boxes contained full sets of United States official documents for authorized depositories, and 2,201 were filled with departmental and other publications for depositories of partial sets and for miscellaneous correspondents. The number of boxes sent to each foreign country and the dates of transmission are shown in the following table:

Consignments of exchanges for foreign countries.

Country.	Number of boxes.	Date of transmission.
ARGENTINA.....	43	July 24, Aug. 24, Sept. 25, Oct. 23, Nov. 25, 1912; Jan. 18, Feb. 26, Apr. 3, June 4, 20, 1913.
AUSTRIA.....	99	July 10, Aug. 7, Sept. 11, Oct. 9, Dec. 11, 1912; Jan. 8, Feb. 5, Mar. 12, Apr. 9, May 14, June 11, 20, 1913.
BELGIUM.....	77	July 6, 27, Aug. 17, 31, Sept. 20, Oct. 12, Nov. 15, Dec. 7, 1912; Jan. 11, Feb. 1, Mar. 8, 29, Apr. 12, May 3, June 7, 28, 1913.
BOLIVIA.....	5	Aug. 28, Nov. 30, 1912; Feb. 27, Apr. 3, June 9, 1913.
BRAZIL.....	42	July 24, Aug. 24, Sept. 25, Oct. 23, Nov. 25, Dec. 19, 1912; Jan. 16, Feb. 26, Apr. 3, June 5, 20, 1913.
BRITISH COLONIES.....	17	July 6, 13, Aug. 3, 10, 17, Sept. 7, 21, Nov. 16, 1912; Feb. 8, 15, Mar. 22, 29, Apr. 18, May 2, 24, June 6, 27, 1913.
BRITISH GUIANA.....	5	Sept. 19, Oct. 31, 1912; Jan. 22, Feb. 28, June 16, 1913.
BULGARIA.....	6	Jan. 6, Feb. 27, Apr. 5, June 10, 1913.
CANADA.....	7	July 30, Aug. 31, Dec. 2, 1912; Feb. 1, Mar. 13, May 5, June 20, 1913.
CHILE.....	28	July 24, Aug. 24, Sept. 25, Nov. 25, 1912; Jan. 18, Feb. 26, Apr. 3, June 5, 20, 1913.
CHINA.....	18	July 30, 31, Aug. 31, Sept. 19, Nov. 8, Dec. 2, 13, 1912; Jan. 3, 29, Feb. 1, Mar. 1, 6, 13, Apr. 29, May 5, June 10, 20, 1913.
COLOMBIA.....	20	Aug. 28, Oct. 23, Nov. 30, 1912; Jan. 18, Feb. 26, Apr. 3, June 9, 20, 1913.
COSTA RICA.....	16	July 24, Aug. 28, Sept. 26, Nov. 30, 1912; Jan. 18, Feb. 26, Apr. 3, June 9, 20, 1913.
CUBA.....	7	July 30, Aug. 31, Dec. 2, 1912; Feb. 1, Mar. 13, May 5, June 20, 1913.
DENMARK.....	35	July 20, Aug. 15, Sept. 19, Oct. 17, Nov. 18, Dec. 12, 1912; Jan. 16, Feb. 14, Mar. 20, Apr. 15, May 21, June 24, 1913.
ECUADOR.....	6	Aug. 28, Nov. 30, 1912; Jan. 29, Feb. 27, May 1, June 9, 1913.
EGYPT.....	13	Aug. 10, Sept. 14, Oct. 12, Nov. 23, Dec. 28, 1912; Feb. 8, Mar. 22, Apr. 22, May 31, June 25, 1913.
FRANCE.....	230	July 11, 25, Aug. 15, 29, Sept. 19, Oct. 3, 24, Nov. 13, Dec. 5, 26, 1912; Jan. 16, 30, Feb. 13, Mar. 6, 27, Apr. 10, 24, May 22, June 19, 20, 1913.
GERMANY.....	422	July 2, 9, 16, 23, 30, Aug. 6, 13, 20, 27, Sept. 3, 10, 17, 24, Oct. 1, 8, 15, 22, 29, Nov. 7, 19, 26, Dec. 3, 10, 17, 24, 1912; Jan. 7, 14, 21, 28, Feb. 4, 11, 19, 25, Mar. 11, 18, 25, Apr. 1, 8, 15, 22, 29, May 6, 13, 20, 27, June 3, 10, 17, 24, 1913.
GREAT BRITAIN AND IRELAND.....	439	July 6, 13, 20, 27, Aug. 3, 10, 17, 24, 31, Sept. 7, 14, 21, 28, Oct. 5, 12, 19, 26, Nov. 5, 9, 16, 23, 30, Dec. 7, 14, 21, 1912; Jan. 4, 11, 18, 25, Feb. 1, 8, 15, 21, Mar. 1, 8, 15, 22, 29, Apr. 4, 11, 18, 25, May 2, 9, 16, 24, 31, June 6, 14, 21, 27, 1913.
GREECE.....	19	Aug. 31, Oct. 31, 1912; Jan. 3, Feb. 27, Apr. 5, June 18, 20, 1913.
GUATEMALA.....	6	Aug. 28, Nov. 30, 1912; Jan. 29, Feb. 27, May 1, June 9, 1913.
HAITI.....	7	July 30, Sept. 26, 1912; Jan. 3, Feb. 26, Apr. 3, June 7, 20, 1913.
HONDURAS.....	6	Aug. 28, Nov. 30, 1912; Jan. 29, Feb. 27, May 1, June 9, 1913.
HUNGARY.....	45	July 10, Aug. 7, Sept. 11, Oct. 9, Nov. 20, Dec. 11, 1912; Jan. 8, Feb. 5, Mar. 12, Apr. 9, May 14, June 11, 20, 1913.
INDIA.....	46	July 6, 13, 20, 27, Aug. 3, 10, 17, 24, 31, Sept. 7, 14, 21, 26, Oct. 5, 12, 26, Nov. 16, 30, Dec. 7, 14, 1912; Jan. 4, 18, 25, Feb. 8, 15, Mar. 1, 22, 29, Apr. 11, May 24, June 6, 27, 1913.

Consignments of exchanges for foreign countries—Continued.

Country.	Number of boxes.	Date of transmission.
ITALY.....	107	July 1, Aug. 10, Sept. 12, Oct. 12, Nov. 25, Dec. 28, 1912; Feb. 8, Mar. 22, Apr. 22, May 31, June 25, 1913.
JAMAICA.....	6	Sept. 17, Nov. 30, 1912; Jan. 30, Feb. 28, May 1, June 16, 1913.
JAPAN.....	61	July 20, Aug. 23, Sept. 20, Oct. 17, Nov. 25, Dec. 20, 1912; Jan. 21, Feb. 20, Mar. 20, Apr. 17, June 20, 1913.
KOREA.....	5	Sept. 17, Nov. 30, 1912; Feb. 28, May 1, June 28, 1913.
LIBERIA.....	5	Sept. 18, Nov. 30, 1912; Feb. 28, May 1, June 16, 1913.
LOURENÇO MARQUEZ..	2	Feb. 27, June 28, 1913.
MANITOBA.....	7	July 30, Aug. 31, Dec. 2, 1912; Feb. 1, Mar. 13, May 5, June 20, 1913.
MEXICO.....	7	July 30, Aug. 31, Dec. 2, 1912; Feb. 1, Mar. 13, May 5, June 20, 1913.
MONTENEGRO.....	2	Feb. 27, June 30, 1913.
NETHERLANDS.....	53	July 9, 30, Aug. 13, 27, Sept. 10, Oct. 8, Nov. 18, Dec. 10, 1912; Jan. 14, 29, Feb. 11, Mar. 11, 25, Apr. 8, May 6, 27, June 17, 20, 1913.
NEWFOUNDLAND.....	3	July 31, 1912; Mar. 29, June 30, 1913.
NEW SOUTH WALES...	31	July 25, Aug. 21, Sept. 24, Oct. 17, Nov. 23, 1912; Jan. 15, Feb. 20, Mar. 26, Apr. 16, May 26, June 23, 1913.
NEW ZEALAND.....	28	July 25, Aug. 21, Sept. 24, Oct. 18, Nov. 23, 1912; Jan. 15, 23, Feb. 20, Mar. 26, Apr. 16, May 26, June 23, 1913.
NICARAGUA.....	4	Nov. 30, 1912; Feb. 27, May 1, June 9, 1913.
NORWAY.....	35	July 20, Aug. 15, Sept. 20, Oct. 17, Nov. 18, 1912; Jan. 3, Feb. 14, Mar. 20, Apr. 15, May 21, June 24, 1913.
ONTARIO.....	7	July 30, Aug. 31, Dec. 2, 1912; Feb. 1, Mar. 13, May 5, June 20, 1913.
PALESTINE.....	8	Feb. 28, May 31, 1913.
PARAGUAY.....	6	July 24, Aug. 27, Nov. 30, 1912; Feb. 27, Apr. 3, June 7, 1913.
PERU.....	18	July 24, Aug. 24, Sept. 25, Nov. 25, 1912; Jan. 18, Feb. 26, Apr. 3, June 5, 20, 1913.
PORTUGAL.....	23	July 20, Aug. 15, Sept. 20, Oct. 17, Nov. 18, 1912; Jan. 3, Feb. 14, Mar. 20, Apr. 15, May 21, June 30, 1913.
QUEBEC.....	7	July 30, Aug. 31, Dec. 2, 1912; Feb. 1, Mar. 13, May 5, June 20, 1913.
QUEENSLAND.....	20	July 25, Aug. 21, Sept. 24, Oct. 18, Nov. 23, 1912; Jan. 15, Feb. 20, Mar. 26, Apr. 16, May 26, June 23, 1913.
ROUMANIA.....	9	Aug. 28, Sept. 27, Nov. 25, 1912; Jan. 31, Feb. 27, Apr. 5, June 10, 1913.
RUSSIA.....	86	July 12, Aug. 8, Sept. 10, Oct. 10, Nov. 21, Dec. 21, 1912; Jan. 9, Feb. 6, Mar. 13, Apr. 10, May 15, June 12, 20, 1913.
SALVADOR.....	5	Aug. 28, Nov. 30, 1912; Feb. 27, May 1, June 9, 1913.
SERVIA.....	14	July 30, Aug. 29, Sept. 27, 1912; Jan. 3, Feb. 27, Apr. 5, June 10, 20, 1913.
SIAM.....	6	Sept. 18, Nov. 8, 1912; Jan. 3, Feb. 28, May 1, June 18, 1913.
SOUTH AUSTRALIA....	23	July 25, Aug. 21, Sept. 24, Oct. 17, Nov. 23, 1912; Jan. 15, Feb. 20, Mar. 26, Apr. 16, May 26, June 23, 1913.
SPAIN.....	35	Aug. 10, Sept. 12, Oct. 26, Nov. 30, Dec. 28, 1912; Feb. 8, Mar. 22, May 3, 31, June 25, 1913.
SWEDEN.....	65	July 11, Aug. 8, Sept. 12, Oct. 10, Nov. 21, Dec. 12, 1912; Jan. 9, Feb. 6, Mar. 13, Apr. 10, May 15, June 12, 20, 1913.
SWITZERLAND.....	64	July 6, 27, Aug. 17, 31, Sept. 20, Oct. 12, Nov. 15, Dec. 7, 28, 1912; Jan. 11, Feb. 1, Mar. 8, 29, Apr. 12, May 3, June 7, 28, 1913.
SYRIA.....	4	Sept. 18, 1912; Jan. 30, Apr. 26, June 10, 1913.
TASMANIA.....	14	July 20, 1912; Feb. 8, Mar. 8, 29, Apr. 25, May 24, June 27, 1913.
TRINIDAD.....	5	Sept. 17, Nov. 30, 1912; Feb. 28, May 1, June 28, 1913.
TURKEY.....	12	July 31, Aug. 31, Sept. 18, Oct. 31, Nov. 8, 1912; Jan. 3, Feb. 26, 28, Apr. 5, June 10, 1913.
UNION OF SOUTH AFRICA.	28	July 31, Aug. 29, Sept. 26, Oct. 30, Nov. 25, 1912; Jan. 22, 28, Feb. 27, Apr. 5, May 10, June 20, 1913.

Consignments of exchanges for foreign countries—Continued.

Country.	Number of boxes.	Date of transmission.
URUGUAY.....	19	July 24, Aug. 28, Sept. 26, Oct. 23, Nov. 25, 1912; Jan. 18, Feb. 26, Apr. 3, June 6, 20, 1913.
VENEZUELA.....	16	July 24, Aug. 28, Sept. 26, Nov. 30, 1912; Jan. 29, Feb. 26, Apr. 3, June 7, 1913.
VICTORIA.....	31	July 2, Aug. 21, Sept. 24, Oct. 18, Nov. 23, 1912; Jan. 15, Feb. 20, Mar. 26, Apr. 16, May 26, June 23, 1913.
WESTERN AUSTRALIA..	37	July 6, 13, Aug. 17, 24, Sept. 7, 14, 21, Oct. 12, Nov. 5, 16, 30, Dec. 7, 14, 1912; Jan. 4, 18, 25, Feb. 8, 15, Mar. 1, 29, Apr. 11, 25, May 24, June 6, 27, 1913.
WINDWARD AND LEE- WARD ISLANDS.	5	Oct. 31, Nov. 30, 1912; Feb. 28, May 1, June 16, 1913.

A part of the contents of a consignment forwarded under date of May 14 (boxes Nos. 1640–1646 and 7896) was damaged by water while in transit to the Central Statistical Commission in Vienna. Steps will be taken to duplicate as many of the damaged publications as are available for distribution.

FOREIGN DEPOSITORIES OF UNITED STATES GOVERNMENTAL DOCUMENTS.

In accordance with treaty stipulations, and under the authority of the resolutions of Congress of March 2, 1867, and March 2, 1901, setting apart a certain number of documents for exchange with foreign countries, there are now sent regularly to depositories abroad 56 full sets of United States official publications and 36 partial sets. During the year the Province of Bombay and the Corporation of Glasgow were added to the list of recipients of full sets; and Finland, British Guiana, the Free City of Lübeck, and the Province of Madras to the list receiving partial sets. While Finland and the Province of Madras were added to the list of countries receiving partial sets in November, 1912, the Library of Congress has, so far as it was possible to do so, completed the series from 1902 to that time.

The recipients of full and partial sets are as follows:

DEPOSITORIES OF FULL SETS.

- ARGENTINA: Ministerio de Relaciones Exteriores, Buenos Aires.
- AUSTRALIA: Library of the Commonwealth Parliament, Melbourne.
- AUSTRIA: K. K. Statistische Zentral-Kommission, Vienna.
- BADEN: Universitäts-Bibliothek, Freiburg. (Depository of the Grand Duchy of Baden.)
- BAVARIA: Königliche Hof- und Staats-Bibliothek, Munich.
- BELGIUM: Bibliothèque Royale, Brussels.
- BOMBAY: Secretary to the Government, Bombay.
- BRAZIL: Bibliotheca Nacional, Rio de Janeiro.

- BUENOS AIRES: Biblioteca de la Universidad Nacional de La Plata. (Depository of the Province of Buenos Aires.)
- CANADA: Library of Parliament, Ottawa.
- CHILE: Biblioteca del Congreso Nacional, Santiago.
- CHINA: American-Chinese Publication Exchange Department, Shanghai Bureau of Foreign Affairs, Shanghai.
- COLOMBIA: Biblioteca Nacional, Bogota.
- COSTA RICA: Oficina de Depósito y Canje Internacional de Publicaciones, San José.
- CUBA: Secretaria de Estado (Asuntos Generales y Canje Internacional), Habana.
- DENMARK: Kongelige Bibliotheket, Copenhagen.
- ENGLAND: British Museum, London.
- FRANCE: Bibliothèque Nationale, Paris.
- GERMANY: Deutsche Reichstags-Bibliothek, Berlin.
- GLASGOW: City Librarian, Mitchell Library, Glasgow.
- GREECE: Bibliothèque Nationale, Athens.
- HAITI: Secrétairerie d'État des Relations Extérieures, Port au Prince.
- HUNGARY: Hungarian House of Delegates, Budapest.
- INDIA: Department of Education (Books), Government of India, Calcutta.
- IRELAND: National Library of Ireland, Dublin.
- ITALY: Biblioteca Nazionale Vittorio Emanuele, Rome.
- JAPAN: Imperial Library of Japan, Tokyo.
- LONDON: London School of Economics and Political Science. (Depository of the London County Council.)
- MANITOBA: Provincial Library, Winnipeg.
- MEXICO: Instituto Bibliográfico, Biblioteca Nacional, Mexico.
- NETHERLANDS: Library of the States General, The Hague.
- NEW SOUTH WALES: Public Library of New South Wales, Sydney.
- NEW ZEALAND: General Assembly Library, Wellington.
- NORWAY: Stortingets Bibliothek, Christiania.
- ONTARIO: Legislative Library, Toronto.
- PARIS: Préfecture de la Seine.
- PERU: Biblioteca Nacional, Lima.
- PORTUGAL: Bibliotheca Nacional, Lisbon.
- PRUSSIA: Königliche Bibliothek, Berlin.
- QUEBEC: Library of the Legislature of the Province of Quebec, Quebec.
- QUEENSLAND: Parliamentary Library, Brisbane.
- RUSSIA: Imperial Public Library, St. Petersburg.
- SAXONY: Königliche Oeffentliche Bibliothek, Dresden.
- SERBIA: Section Administrative du Ministère des Affaires Étrangères, Belgrade.
- SOUTH AUSTRALIA: Parliamentary Library, Adelaide.
- SPAIN: Servicio del Cambio Internacional de Publicaciones, Cuerpo Facultativo de Archiveros, Bibliotecarios y Arqueólogos, Madrid.
- SWEDEN: Kungliga Bibliotheket, Stockholm.
- SWITZERLAND: Bibliothèque Fédérale, Berne.
- TASMANIA: Parliamentary Library, Hobart.
- TURKEY: Department of Public Instruction, Constantinople.
- UNION OF SOUTH AFRICA: State Library, Pretoria, Transvaal.
- URUGUAY: Oficina de Canje Internacional de Publicaciones, Montevideo.
- VENEZUELA: Biblioteca Nacional, Caracas.
- VICTORIA: Public Library, Melbourne.
- WESTERN AUSTRALIA: Public Library of Western Australia, Perth.
- WÜRTTEMBERG: Königliche Landesbibliothek, Stuttgart.

DEPOSITORIES OF PARTIAL SETS.

- ALBERTA: Legislative Library, Edmonton.
 ALSACE-LORRAINE: K. Ministerium für Elsass-Lothringen, Strassburg.
 BOLIVIA: Ministerio de Colonización y Agricultura, La Paz.
 BREMEN: Senatskommission für Reichs- und Auswärtige Angelegenheiten.
 BRITISH COLUMBIA: Legislative Library, Victoria.
 BRITISH GUIANA: Government Secretary's Office, Georgetown, Demerara.
 BULGARIA: Minister of Foreign Affairs, Sofia.
 CEYLON: United States Consul, Colombo.
 ECUADOR: Biblioteca Nacional, Quito.
 EGYPT: Bibliothéque Khédiviale, Cairo.
 FINLAND: Chancery of Governor, Helsingfors.
 GUATEMALA: Secretary of the Government, Guatemala.
 HAMBURG: Senatskommission für die Reichs- und Auswärtigen Angelegenheiten.
 HESSE: Grossherzogliche Hof-Bibliothek, Darmstadt.
 HONDURAS: Secretary of the Government, Tegucigalpa.
 JAMAICA: Colonial Secretary, Kingston.
 LIBERIA: Department of State, Monrovia.
 LOURENÇO MARQUEZ: Government Library, Lourenço Marquez.
 LÜBECK: President of the Senate.
 MADRAS, PROVINCE OF: Chief Secretary to the Government of Madras, Public Department, Madras.
 MALTA: Lieutenant Governor, Valetta.
 MONTENEGRO: Ministère des Affaires Étrangères, Cetinje.
 NEW BRUNSWICK: Legislative Library, Fredericton.
 NEWFOUNDLAND: Colonial Secretary, St. John's.
 NICARAGUA: Superintendente de Archivos Nacionales, Managua.
 NORTHWEST TERRITORIES: Government Library, Regina.
 NOVA SCOTIA: Provincial Secretary of Nova Scotia, Halifax.
 PANAMA: Secretaria de Relaciones Exteriores, Panama.
 PARAGUAY: Oficina General de Inmigracion, Asuncion.
 PRINCE EDWARD ISLAND: Legislative Library, Charlottetown.
 ROUMANIA: Academia Romana, Bucharest.
 SALVADOR: Ministerio de Relaciones Exteriores, San Salvador.
 SIAM: Department of Foreign Affairs, Bangkok.
 STRAITS SETTLEMENTS: Colonial Secretary, Singapore.
 UNITED PROVINCES OF AGRA AND OUDH: Under Secretary to Government, Allahabad.
 VIENNA: Bürgermeister der Haupt- und Residenz-Stadt.

INTERPARLIAMENTARY EXCHANGE OF OFFICIAL JOURNALS.

The interparliamentary exchange of official journals is carried on under a resolution of the Congress approved March 4, 1909, setting aside such number as might be required, not exceeding 100 copies, of the daily issue of the Congressional Record for exchange, through the agency of the Smithsonian Institution, with the legislative chambers of such foreign Governments as might agree to send to the United States current copies of their parliamentary records or like publications. The purpose of this resolution was to enable the institution, on the part of the United States, to more fully carry into

effect the provisions of the convention concluded at Brussels in 1886, providing for the immediate exchange of the official journal.

The Governments of the Province of Buenos Aires, Liberia, and Queensland have entered into this exchange during the year. A complete list of the Governments to which the Congressional Record is now sent is given below:

Argentine Republic.	Italy.
Australia.	Liberia.
Austria.	New South Wales.
Baden.	New Zealand.
Belgium.	Portugal.
Brazil.	Prussia.
Buenos Aires, Province of.	Queensland.
Canada.	Roumania.
Cuba.	Russia.
Denmark.	Servia.
France.	Spain.
Great Britain.	Switzerland.
Greece.	Transvaal.
Guatemala.	Union of South Africa.
Honduras.	Uruguay.
Hungary.	Western Australia.

There are, therefore, at present 32 countries with which the immediate exchange is conducted. To some of these countries, however, two copies of the Congressional Record are sent, one to the upper and one to the lower House of Parliament—the total number transmitted being 37.

RULES GOVERNING THE TRANSMISSION OF EXCHANGES.

The circular containing the rules governing the transmission of exchanges has been revised, and is here reproduced for the information of those who may wish to make use of the facilities of the service in the forwarding of publications.

In effecting the distribution of its first publications abroad, the Smithsonian Institution established relations with certain foreign scientific societies and libraries, by means of which it was enabled to materially assist institutions and individuals of this country in the transmission of their publications abroad, and also foreign societies and individuals in distributing their publications in the United States.

In recent years the Smithsonian Institution has been charged with the duty of conducting the official Exchange Bureau of the United States Government, through which the publications authorized by Congress are exchanged for those of other Governments; and by a formal treaty it acts as intermediary between the learned bodies and scientific and literary societies of the contracting States for the reception and transmission of their publications.

Attention is called to the fact that this is an international and not a domestic exchange service, and that it is designed to facilitate exchanges between the United States and other countries only. As exchanges from domestic sources for addresses in Hawaii, the Philippine Islands, Porto Rico, and other territory

subject to the jurisdiction of the United States do not come within the designation "international," they are not accepted for transmission.

Packages prepared in accordance with the rules enumerated below will be received by the Smithsonian Institution from persons or institutions of learning in the United States and forwarded to their destinations abroad through its own agents or through the various exchange bureaus in other countries. The Smithsonian agents and many of these bureaus will likewise receive from correspondents in their countries such publications for addresses in the United States and territory subject to its jurisdiction as may be delivered to them under rules similar to those prescribed herein, and will forward them to Washington, after which the Institution will undertake their distribution.

On the receipt of a consignment from a domestic source it is assigned a "record number," which number is placed on each package contained therein. After the packages have been recorded they are packed in boxes with packages from other senders intended for the same countries, and are forwarded by fast freight to the bureaus or agencies abroad which have undertaken to distribute exchanges in those countries. To Great Britain and Germany shipments are made weekly; to all other countries at intervals not exceeding one month.

Consignments from abroad for correspondents in the United States and its outlying possessions are distributed by mail under frank.

The Institution assumes no responsibility in the transmission of packages intrusted to its care, but at all times uses its best endeavors to forward exchanges to their destinations as promptly as possible.

RULES.

The rules governing the Smithsonian International Exchange Service are as follows:

1. Consignments from correspondents in the United States containing packages for transmission abroad should be addressed "Smithsonian Institution, International Exchanges, Washington, D. C."

2. In forwarding a consignment the sender should mail a letter to the Institution, stating by what route it is being shipped, and the number of boxes or parcels which it comprises. A list giving the name and address of each consignee should also be furnished.

3. Packages should be legibly addressed, using, when practicable, the language of the country to which they are to be forwarded. In order to avoid any possible dispute as to ownership, names of individuals should be omitted from packages intended for societies and other establishments.

4. Packages should be securely wrapped in stout paper and, when necessary, tied with strong twine. Cardboard should be used in some instances to protect plates from crumpling.

5. Letters are not permitted in exchange packages.

6. If donors desire acknowledgments, packages may contain receipt forms to be signed and returned by the establishment or individual addressed. Should publications be desired in exchange, a request to that effect may be printed on the receipt form or on the package.

7. Exchanges intended for transmission abroad must be delivered to the Smithsonian Institution *with all charges to Washington prepaid*.

8. The work carried on by the International Exchange Service is not in any sense of a commercial nature, but is restricted to the transmission of publications sent as exchanges or donations. Books ordered through the trade are therefore necessarily excluded.

9. Specimens are not accepted for distribution, except when permission has been obtained from the Institution.

LIST OF BUREAUS OR AGENCIES THROUGH WHICH EXCHANGES ARE TRANSMITTED.

The following is a list of the bureaus or agencies through which exchanges are transmitted:

ALGERIA, *via* France.

ANGOLA, *via* Portugal.

ARGENTINA: Comisión Protectora de Bibliotecas Populares, Reconquista 538, Buenos Aires.

AUSTRIA: K. K. Statistische Zentral-Kommission, Vienna.

AZORES, *via* Portugal.

BELGIUM: Service Belge des Échanges Internationaux, Rue du Musée 5, Brussels.

BOLIVIA: Oficina Nacional de Estadística, La Paz.

BRAZIL: Serviço de Permutações Internacionais, Bibliotheca Nacional, Rio de Janeiro.

BRITISH COLONIES: Crown Agents for the Colonies, London.¹

BRITISH GUIANA: Royal Agricultural and Commercial Society, Georgetown.

BRITISH HONDURAS: Colonial Secretary, Belize.

BULGARIA: Institutions Scientifiques de S. M. le Roi de Bulgarie, Sofia.

CANARY ISLANDS, *via* Spain.

CHILE: Servicio de Canjes Internacionales, Biblioteca Nacional, Santiago.

CHINA: Zi-ka-wei Observatory, Shanghai.

COLOMBIA: Oficina de Canjes Internacionales y Reparto, Biblioteca Nacional, Bogota.

COSTA RICA: Oficina de Depósito y Canje Internacional de Publicaciones, San José.

DENMARK: Kongelige Danske Videnskabernes, Selskab, Copenhagen.

DUTCH GUIANA: Surinaamsche Koloniale Bibliotheek, Paramaribo.

ECUADOR: Ministerio de Relaciones Exteriores, Quito.

EGYPT: Government Publications Office, Printing Department, Cairo.

FRANCE: Service Français des Échanges Internationaux, 110 Rue de Grenelle, Paris.

GERMANY: Amerika-Institut, Berlin, N. W. 7.

GREAT BRITAIN AND IRELAND: Messrs. William Wesley & Son, 28 Essex Street, Strand, London.

GREECE: Bibliothèque Nationale, Athens.

GREENLAND, *via* Denmark.

GUADELOUPE, *via* France.

GUATEMALA: Instituto Nacional de Varones, Guatemala.

GUINEA, *via* Portugal.

HAITI: Secrétaire d'État des Relations Extérieures, Port au Prince.

HONDURAS: Biblioteca Nacional, Tegucigalpa.

HUNGARY: Dr. Julius Pikler, Municipal Office of Statistics, Váci-utca 80, Budapest.

ICELAND, *via* Denmark.

INDIA: India Store Department, India Office, London.

ITALY: Ufficio degli Scambi Internazionali, Biblioteca Nazionale Vittorio Emanuele, Rome.

JAMAICA: Institute of Jamaica, Kingston.

JAPAN: Imperial Library of Japan, Tokyo.

JAVA, *via* Netherlands.

KOREA: His Imperial Japanese Majesty's Residency-General, Seoul.

¹ This method is employed for communicating with several of the British colonies with which no medium is available for forwarding exchanges direct.

LIBERIA: Bureau of Exchanges, Department of State, Monrovia.
LOURENÇO MARQUEZ: Government Library, Lourenço Marquez.
LUXEMBURG, *via* Germany.
MADAGASCAR, *via* France.
MADEIRA, *via* Portugal.
MONTENEGRO: Ministère des Affaires Étrangères, Cetinje.
MOZAMBIQUE, *via* Portugal.
NETHERLANDS: Bureau Scientifique Central Néerlandais, Bibliothèque de l'Université, Leyden.
NEW GUINEA, *via* Netherlands.
NEW SOUTH WALES: Public Library of New South Wales, Sydney.
NEW ZEALAND: Dominion Museum, Wellington.
NICARAGUA: Ministerio de Relaciones Exteriores, Managua.
NORWAY: Kongelige Norske Frederiks Universitet Bibliotheket, Christiania.
PANAMA: Secretaria de Relaciones Exteriores, Panama.
PARAGUAY: Ministerio de Relaciones Exteriores, Asuncion.
PERSIA: Board of Foreign Missions of the Presbyterian Church, New York City.
PERU: Oficina de Reparto, Depósito y Canje Internacional de Publicaciones, Ministerio de Fomento, Lima.
PORTUGAL: Serviço de Permutações Internacionais, Bibliotheca Nacional, Lisbon.
QUEENSLAND: Bureau of Exchanges of International Publications, Chief Secretary's Office, Brisbane.
ROUMANIA: Academia Romana, Bucharest.
RUSSIA: Commission Russe des Échanges Internationaux, Bibliothèque Impériale Publique, St. Petersburg.
SALVADOR: Ministerio de Relaciones Exteriores, San Salvador.
SERBIA: Section Administrative du Ministère des Affaires Étrangères, Belgrade.
SIAM: Department of Foreign Affairs, Bangkok.
SOUTH AUSTRALIA: Public Library of South Australia, Adelaide.
SPAIN: Servicio del Cambio Internacional de Publicaciones, Cuerpo Facultativo de Archiveros, Bibliotecarios y Arqueólogos, Madrid.
SUMATRA, *via* Netherlands.
SWEDEN: Kongliga Svenska Vetenskaps Akademien, Stockholm.
SWITZERLAND: Service des Échanges Internationaux, Bibliothèque Fédérale Centrale, Berne.
SYRIA: Board of Foreign Missions of the Presbyterian Church, New York.
TASMANIA: Secretary to the Premier, Hobart.
TRINIDAD: Royal Victoria Institute of Trinidad and Tobago, Port-of-Spain.
TUNIS, *via* France.
TURKEY: American Board of Commissioners for Foreign Missions, Boston.
UNION OF SOUTH AFRICA: Government Printing Works, Pretoria, Transvaal.
URUGUAY: Oficina de Canje Internacional, Montevideo.
VENEZUELA: Biblioteca Nacional, Caracas.
VICTORIA: Public Library of Victoria, Melbourne.
WESTERN AUSTRALIA: Public Library of Western Australia, Perth.
WINDWARD AND LEEWARD ISLANDS: Imperial Department of Agriculture, Bridgetown, Barbados.

Respectfully submitted.

F. W. TRUE,
*Assistant Secretary in Charge
 of Library and Exchanges.*

DR. CHARLES D. WALCOTT,
Secretary of the Smithsonian Institution.

SEPTEMBER 27, 1913.

APPENDIX 4.

REPORT ON THE NATIONAL ZOOLOGICAL PARK.

SIR: I have the honor to submit herewith a report of the operations of the National Zoological Park for the fiscal year ending June 30, 1913.

The general appropriation made by Congress for the improvement and maintenance during that year was \$100,000. The cost of food for the animals was \$20,235, which is somewhat less than during the previous year, being due to the decline in prices of forage from the extremely high rates which then prevailed. The expenditures for upkeep were greater than usual, especially as to out-door cages, inclosures, and fences.

ACCESSIONS.

During the previous year, owing to the necessity of providing a fireproof building for the central heating plant and making certain urgently needed small improvements, only a small sum was used for the purchase of animals. During the present year several important animals have been added, including a pair of young African elephants, three dromedaries, a pair of cheetahs, several species of gazelles, and other animals, purchased from the Government Zoological Garden at Giza, Egypt. These were engaged some time before the end of the fiscal year, but, as explained below, they did not finally reach the park until a little after the end of the period covered by this report.

Seven ostriches from southern California were purchased, and two moose, a male and a female, were obtained by exchange from the Rocky Mountains National Park in Alberta, Canada. The accessions, with the animals from Giza, included 15 species not previously represented in the collection.

The total amount expended for purchase and transportation of animals was \$6,900.

Mammals and birds born and hatched in the park numbered 78 and included polar, grizzly, and Alaskan brown bears, alpaca, llama, American tapir, chamois, harnessed antelope, deer of several species, with some other mammals and various birds.

EXCHANGES.

The number of exchanges was smaller than usual. As already mentioned, two moose were received from the Rocky Mountains National Park and several animals from dealers.

ANIMALS FROM GIZA.

In the latter part of March, 1913, an offer of some desirable animals was received from the Government Zoological Garden at Giza, Egypt. This offer included two young African elephants, a male and a female, and a number of other less important animals. The two elephants were engaged for the park, together with three dromedaries and two Arabian baboons. As the Egyptian authorities required the animals to be accepted at their gardens, it was thought advisable to send the head keeper of the park to receive them and accompany them during transportation. He left Washington May 15, 1912, and arrived at Giza on June 19. On his arrival he found that several other desirable animals were available there and was authorized by cable to secure them for the park, so that there were altogether 21 animals in the shipment. It was necessary to go to London to arrange for transportation, and on the way from there to Egypt the zoological gardens at Amsterdam, Rotterdam, Antwerp, Cologne, and Rome were visited.

ANIMALS IN THE COLLECTION JUNE 30, 1913.

MAMMALS.

Grivet monkey (<i>Cercopithecus sabæus</i>)	1	Polar bear (<i>Thalarctos maritimus</i>)	2
Green monkey (<i>Cercopithecus callitrichus</i>)	1	European brown bear (<i>Ursus arctos</i>)	2
Mona monkey (<i>Cercopithecus mona</i>)	2	Kadiak bear (<i>Ursus middendorffi</i>)	1
Diana monkey (<i>Cercopithecus diana</i>)	1	Yakutat bear (<i>Ursus dalli</i>)	1
Sooty mangabey (<i>Cercocebus fuliginosus</i>)	2	Alaskan brown bear (<i>Ursus gyas</i>)	3
Bonnet monkey (<i>Macacus sinicus</i>)	1	Hybrid bear (<i>Ursus gyas-arctos</i>)	1
Macaque monkey (<i>Macacus cynomolgus</i>)	3	Kidder's bear (<i>Ursus kidderi</i>)	2
Pig-tailed monkey (<i>Macacus nemestrinus</i>)	4	Himalayan bear (<i>Ursus thibetanus</i>)	1
Rhesus monkey (<i>Macacus rhesus</i>)	16	Grizzly bear (<i>Ursus horribilis</i>)	3
Brown macaque (<i>Macacus arctoides</i>)	3	Black bear (<i>Ursus americanus</i>)	9
Japanese monkey (<i>Macacus fuscatus</i>)	3	Cinnamon bear (<i>Ursus americanus</i>)	2
Moor monkey (<i>Macacus maurus</i>)	1	Malay bear (<i>Ursus malayanus</i>)	2
Black ape (<i>Cynopithecus niger</i>)	1	Sloth bear (<i>Melursus ursinus</i>)	1
Chacma (<i>Papio porcarius</i>)	1	Kinkajou (<i>Cercoleptes caudivolvulus</i>)	1
Hamadryas baboon (<i>Papio hamadryas</i>)	1	Cacomistle (<i>Bassariscus astuta</i>)	1
Mandrill (<i>Papio maimon</i>)	3	Gray coatimundi (<i>Nasua narica</i>)	5
Gray spider monkey (<i>Ateles geoffroyi</i>)	1	Raccoon (<i>Procyon lotor</i>)	19
White-throated capuchin (<i>Cebus leucurus</i>)	1	American badger (<i>Taxidea taxus</i>)	2
Brown monkey (<i>Cebus fatuellus</i>)	1	Common skunk (<i>Mephitis putida</i>)	4
Durukuli (<i>Nyctipithecus trivirgatus</i>)	2	American marten (<i>Mustela americana</i>)	2
Ruffed lemur (<i>Lemur varius</i>)	2	Fisher (<i>Mustela pennanti</i>)	1
Ring-tailed lemur (<i>Lemur catta</i>)	3	Mink (<i>Putorius vison</i>)	5
		Common ferret (<i>Putorius putorius</i>)	1
		Black-footed ferret (<i>Putorius nigripes</i>)	2
		North American otter (<i>Lutra canadensis</i>)	5
		Eskimo dog (<i>Canis familiaris</i>)	2

Dingo (<i>Canis dingo</i>)-----	2	Indian elephant (<i>Elephas maximus</i>)--	1
Gray wolf (<i>Canis occidentalis</i>)-----	4	Brazilian tapir (<i>Tapirus americanus</i>)--	5
Black wolf (<i>Canis occidentalis</i>)-----	1	Grevy's zebra (<i>Equus grevyi</i>)-----	1
Coyote (<i>Canis latrans</i>)-----	3	Zebra-donkey hybrid (<i>Equus grevyi-</i>	
Woodhouse's coyote (<i>Canis frustror</i>)--	3	asinus)-----	1
Red fox (<i>Vulpes pennsylvanicus</i>)-----	4	Grant's zebra (<i>Equus burchelli granti</i>)	1
Swift fox (<i>Vulpes velox</i>)-----	2	Collared peccary (<i>Dicotyles angulatus</i>)--	3
Arctic fox (<i>Vulpes lagopus</i>)-----	2	Wild boar (<i>Sus serofo</i>)-----	2
Gray fox (<i>Urocyon cinereo-argenteus</i>)--	5	Northern wart hog (<i>Phacochærus atri-</i>	
Spotted hyena (<i>Hyæna crocuta</i>)-----	1	canus)-----	2
African palm civet (<i>Viverra civetta</i>)--	1	Hippopotamus (<i>Hippopotamus am-</i>	
Common genet (<i>Genetta genetta</i>)-----	2	phibius)-----	1
Sudan lion (<i>Felis leo</i>)-----	2	Guanaco (<i>Lama huonachus</i>)-----	3
Kilimanjaro lion (<i>Felis leo sabakiensis</i>)	4	Llama (<i>Lama glama</i>)-----	10
Tiger (<i>Felis tigris</i>)-----	1	Alpaca (<i>Lama pacos</i>)-----	3
Cougar (<i>Felis oregonensis hippolestes</i>)--	3	Vicugna (<i>Lama vicugna</i>)-----	2
Jaguar (<i>Felis onca</i>)-----	1	Bactrian camel (<i>Camelus bactrianus</i>)--	2
Leopard (<i>Felis pardus</i>)-----	2	Muntjac (<i>Cervulus muntjac</i>)-----	1
Black leopard (<i>Felis pardus</i>)-----	1	Sambar deer (<i>Cervus aristotelis</i>)-----	2
Serval (<i>Felis serval</i>)-----	1	Philippine deer (<i>Cervus philippinus</i>)--	1
Ocelot (<i>Felis pardalis</i>)-----	1	Hog deer (<i>Cervus porcinus</i>)-----	6
Canada lynx (<i>Lynx canadensis</i>)-----	1	Barasingha deer (<i>Cervus duvaucelii</i>)--	13
Bay lynx (<i>Lynx rufus</i>)-----	6	Axis deer (<i>Cervus axis</i>)-----	8
Spotted lynx (<i>Lynx rufus texensis</i>)--	2	Japanese deer (<i>Cervus sika</i>)-----	16
Florida lynx (<i>Lynx rufus floridanus</i>)--	1	Red deer (<i>Cervus elaphus</i>)-----	7
Steller's sea lion (<i>Eumetopias stelleri</i>)--	1	American elk (<i>Cervus canadensis</i>)-----	6
California sea lion (<i>Zalophus californi-</i>		Fallow deer (<i>Cervus dama</i>)-----	7
nianus)-----	2	Moose (<i>Alces americanus</i>)-----	1
Northern fur seal (<i>Callotaria alascana</i>)--	1	Virginia deer (<i>Odocoileus virginianus</i>)--	12
Harbor seal (<i>Phoca vitulina</i>)-----	2	Mule deer (<i>Odocoileus hemionus</i>)-----	1
Fox squirrel (<i>Sciurus niger</i>)-----	9	Columbian black-tailed deer (<i>Odocoi-</i>	
Western fox squirrel (<i>Sciurus ludovi-</i>		leus columbianus)-----	1
cianus)-----	8	Cuban deer (<i>Odocoileus</i> sp.)-----	1
Gray squirrel (<i>Sciurus carolinensis</i>)--	40	Coke's hartebeest (<i>Bubalis cokei</i>)-----	1
Black squirrel (<i>Sciurus carolinensis</i>)--	20	Blessbok (<i>Damaliscus albifrons</i>)-----	1
Albino squirrel (<i>Sciurus carolinensis</i>)--	1	White-tailed gnu (<i>Connochætes gnu</i>)--	1
Panama squirrel-----	1	Defassa water buck (<i>Cobus defassa</i>)--	1
Prairie dog (<i>Cynomys ludovicianus</i>)-----	28	Indian antelope (<i>Antilope cervicapra</i>)--	3
Woodchuck (<i>Arctomys monax</i>)-----	3	Nilgai (<i>Boselaphus tragocamelus</i>)-----	2
Albino woodchuck (<i>Arctomys monax</i>)--	1	Congo harnessed antelope (<i>Trage-</i>	
Black woodchuck (<i>Arctomys monax</i>)--	1	laphus gratus)-----	2
Alpine marmot (<i>Arctomys marmotta</i>)--	2	Chamois (<i>Rupicapra tragus</i>)-----	3
American beaver (<i>Castor canadensis</i>)--	2	Tahr (<i>Hemitragus jemlaicus</i>)-----	6
Coypu (<i>Myocastor coypus</i>)-----	1	Common goat (<i>Capra hircus</i>)-----	8
Hutia-conga (<i>Capromys pilorides</i>)-----	2	Angora goat (<i>Capra hircus</i>)-----	5
Indian porcupine (<i>Hystrix leucura</i>)--	2	Barbary sheep (<i>Ovis tragelaphus</i>)-----	15
Canada porcupine (<i>Erethizon dorsa-</i>		Barbados sheep (<i>Ovis aries-trage-</i>	
tus)-----	1	laphus)-----	13
Canada porcupine (<i>Erethizon dorsatus</i>)		Anoa (<i>Anoa depressicornis</i>)-----	1
albino)-----	1	East African buffalo (<i>Buffelus neu-</i>	
Western porcupine (<i>Erethizon epixan-</i>		manni)-----	1
thus)-----	1	Zebu (<i>Bibos indicus</i>)-----	3
Mexican agouti (<i>Dasyprocta mexi-</i>		Yak (<i>Poëphagus grunniens</i>)-----	5
cana)-----	1	American bison (<i>Bison americanus</i>)--	15
Azara's agouti (<i>Dasyprocta azarae</i>)--	2	Hairy armadillo (<i>Dasypus villosus</i>)--	3
Crested agouti (<i>Dasyprocta cristata</i>)--	2	Wallaroo (<i>Macropus robustus</i>)-----	3
Hairy-rumped agouti (<i>Dasyprocta prym-</i>		Red kangaroo (<i>Macropus rufus</i>)-----	3
nolopha)-----	4	Bennett's wallaby (<i>Macropus ruficollis</i>	
Paca (<i>Calogenys paca</i>)-----	2	bennetti)-----	1
Guinea pig (<i>Cavia cutleri</i>)-----	13	Virginia opossum (<i>Didelphys marsupi-</i>	
Patagonian cavy (<i>Dolichotis pata-</i>		alis)-----	2
gonica)-----	3	Virginia opossum (<i>Didelphys marsupi-</i>	
Capybara (<i>Hydrochærus capybara</i>)-----	1	alis) albino-----	1
Domestic rabbit (<i>Lepus cuniculus</i>)-----	37	Common wombat (<i>Phascolomys mitch-</i>	
Cape hyrax (<i>Procavia capensis</i>)-----	1	elli)-----	1

BIRDS.

European blackbird (<i>Merula merula</i>)	1	Yellow tyrant (<i>Pitangus derbianus</i>)	2
Mocking bird (<i>Mimus polyglottos</i>)	1	Giant kingfisher (<i>Dacelo gigas</i>)	1
Catbird (<i>Dumetella carolinensis</i>)	1	Yellow-breasted toucan (<i>Rhamphastos carinatus</i>)	3
Brown thrasher (<i>Toxostoma rufus</i>)	1	Sulphur-crested cockatoo (<i>Cacatua galerita</i>)	3
Japanese robin (<i>Liothrix luteus</i>)	10	White cockatoo (<i>Cacatua alba</i>)	6
White-cheeked bulbul (<i>Pycnonotus leucogenys</i>)	1	Leadbeater's cockatoo (<i>Cacatua leadbeateri</i>)	1
Black bulbul (<i>Pycnonotus pygæus</i>)	1	Bare-eyed cockatoo (<i>Cacatua gymnopsis</i>)	4
Laughing thrush (<i>Garrulus leucolophus</i>)	2	Roseate cockatoo (<i>Cacatua roseicapilla</i>)	12
Bishop finch (<i>Tanagra episcopus</i>)	4	Gang-gang cockatoo (<i>Callocephalon farreri</i>)	1
Orange-cheeked waxbill (<i>Estrela melopoda</i>)	7	Yellow and blue macaw (<i>Ara ararauna</i>)	2
Cordon-bleu (<i>Estrela phænicotis</i>)	8	Red and yellow and blue macaw (<i>Ara macao</i>)	9
Magpie finch (<i>Spermestes fringilloides</i>)	2	Red and blue macaw (<i>Ara chloroptera</i>)	2
Cut-throat finch (<i>Amadina fasciata</i>)	10	Great green macaw (<i>Ara militaris</i>)	1
Zebra finch (<i>Amadina castanotis</i>)	4	Mexican conure (<i>Conurus holochlorus</i>)	1
Black-headed finch (<i>Munia atricapilla</i>)	7	Carolina parakeet (<i>Conuropsis carolinensis</i>)	1
Three-colored finch (<i>Munia malacca</i>)	6	Cuban parrot (<i>Amazona leucocephala</i>)	2
White-headed finch (<i>Munia maja</i>)	9	Orange-winged amazon (<i>Amazona amazonica</i>)	2
Nutmeg finch (<i>Munia punctularia</i>)	6	Porto Rican amazon (<i>Amazona vittata</i>)	1
Java sparrow (<i>Munia oryzivora</i>)	13	Yellow-shouldered amazon (<i>Amazona ochroptera</i>)	2
White Java sparrow (<i>Munia oryzivora</i>)	12	Yellow-fronted amazon (<i>Amazona ochrocephala</i>)	2
Sharp-tailed grass finch (<i>Poephila acuticauda</i>)	2	Red-fronted amazon (<i>Amazona rhodocorytha</i>)	1
Silver-bill finch (<i>Aidemosyne cantans</i>)	12	Yellow-headed amazon (<i>Amazona leucivallanti</i>)	2
Chestnut-breasted finch (<i>Donacola castaneothorax</i>)	6	Blue-fronted amazon (<i>Amazona aestiva</i>)	2
Bearded finch (<i>Spermophila</i> sp.)	2	Lesser vasa parrot (<i>Coracopsis nigra</i>)	2
Napoleon weaver (<i>Pyromelana afra</i>)	4	Banded parakeet (<i>Palæornis fasciata</i>)	1
Madagascar weaver (<i>Foudia madagascariensis</i>)	4	Alexandrine parakeet (<i>Palæornis alexandri</i>)	4
Red-billed weaver (<i>Quelea quelea</i>)	8	Rosella parakeet (<i>Platycercus eximius</i>)	2
Whydah weaver (<i>Vidua paradisæa</i>)	28	Love bird (<i>Agapornis pullaria</i>)	2
Painted bunting (<i>Passerina ciris</i>)	1	Green parakeet (<i>Loriculus</i> sp.)	2
Red-crested cardinal (<i>Paroaria cucullata</i>)	8	Shell parakeet (<i>Melopsittacus undulatus</i>)	9
Rose-breasted grosbeak (<i>Zamelodia ludoviciana</i>)	1	Great horned owl (<i>Bubo virginianus</i>)	8
Common cardinal (<i>Cardinalis cardinalis</i>)	1	Arctic horned owl (<i>Bubo virginianus subarcticus</i>)	1
Siskin (<i>Spinus spinus</i>)	5	Screech owl (<i>Otus asio</i>)	4
Saffron finch (<i>Sycalis flaveola</i>)	19	Barred owl (<i>Strix varia</i>)	3
European goldfinch (<i>Carduelis elegans</i>)	2	Barn owl (<i>Aluco pratincola</i>)	8
Yellow-hammer (<i>Emberiza citrinella</i>)	1	Sparrow hawk (<i>Falco sparverius</i>)	1
Common canary (<i>Serinus canarius</i>)	26	Bald eagle (<i>Haliæetus leucocephalus</i>)	12
Linnet (<i>Linota cannabina</i>)	4	Alaskan bald eagle (<i>Haliæetus leucocephalus alascanus</i>)	1
Bullfinch (<i>Pyrrhula europæa</i>)	1	Golden eagle (<i>Aquila chrysaetos</i>)	2
Cowbird (<i>Molothrus ater</i>)	1	Harpy eagle (<i>Thrasaëtus harpyia</i>)	1
Glossy starling (<i>Lamprolornis caudatus</i>)	1	Chilian eagle (<i>Geranoaëtus melanoleucus</i>)	1
Malabar mynah (<i>Poliopsar malabaricus</i>)	2	Crowned hawk eagle (<i>Spizaëtus coronatus</i>)	1
European raven (<i>Corvus corax</i>)	1	Red-shouldered hawk (<i>Buteo lineatus</i>)	1
American raven (<i>Corvus corax sinuatus</i>)	2		
Common crow (<i>Corvus brachyrhynchos</i>)	1		
Green jay (<i>Xanthoura luxuosa</i>)	1		
White-throated jay (<i>Garrulus leucotis</i>)	2		
Blue jay (<i>Cyanocitta cristata</i>)	3		
American magpie (<i>Pica pica hudsonica</i>)	2		
Red-billed magpie (<i>Urocissa occipitalis</i>)	2		
Piping crow (<i>Gymnorhina tibicen</i>)	2		

Venezuelan hawk	1	Little blue heron (<i>Florida carulea</i>)	1
Caracara (<i>Polyborus cheriway</i>)	3	Reddish egret (<i>Dichromanassa rufescens</i>)	1
Lammergeyer (<i>Gypætus barbatus</i>)	2	Snowy egret (<i>Egretta candidissima</i>)	4
South American condor (<i>Sarcorhamphus gryphus</i>)	2	Great white heron (<i>Herodias egretta</i>)	1
California condor (<i>Gymnogyps californianus</i>)	3	Great blue heron (<i>Ardea herodias</i>)	3
Griffon vulture (<i>Gyps fulvus</i>)	2	Great black-crowned heron (<i>Ardea cocoi</i>)	1
Cinereous vulture (<i>Vultur monachus</i>)	2	Boat-bill (<i>Cancroma cochlearia</i>)	2
Egyptian vulture (<i>Neophron percnopterus</i>)	1	Black stork (<i>Ciconia nigra</i>)	1
Turkey vulture (<i>Cathartes aura</i>)	4	Marabou stork (<i>Leptoptilus dubius</i>)	1
Black vulture (<i>Catharista urubi</i>)	2	Wood ibis (<i>Mycteria americana</i>)	2
King vulture (<i>Gypagus papa</i>)	2	Sacred ibis (<i>Ibis aethiopica</i>)	4
Red-billed pigeon (<i>Columba flavirostris</i>)	4	White ibis (<i>Guara alba</i>)	21
Mourning dove (<i>Zenaidura macroura</i>)	8	Roseate spoonbill (<i>Ajaia ajaja</i>)	1
Peaceful dove (<i>Geopelia tranquilla</i>)	2	European flamingo (<i>Phenicopterus antiquorum</i>)	3
Collared turtle dove (<i>Turtur risorius</i>)	13	Crested screamer (<i>Chauna cristata</i>)	2
Cape masked dove (<i>Oena capensis</i>)	5	Whistling swan (<i>Olor columbianus</i>)	5
Victoria crowned pigeon (<i>Goura victoria</i>)	1	Mute swan (<i>Cygnus gibbus</i>)	4
Purplish guan (<i>Penelope purpurascens</i>)	1	Black swan (<i>Chenopsis atrata</i>)	1
Crested curassow (<i>Crao alector</i>)	1	Muscovy duck (<i>Cairina moschata</i>)	1
Mexican curassow (<i>Crao globicera</i>)	2	White muscovy duck (<i>Cairina moschata</i>)	2
Daubenton's curassow (<i>Crao daubentoni</i>)	2	Wandering tree-duck (<i>Dendrocygna arcuata</i>)	7
Wild turkey (<i>Meleagris gallopavo silvestris</i>)	1	Fulvous tree-duck (<i>Dendrocygna bicolor</i>)	2
Peafowl (<i>Pavo cristata</i>)	60	Brant (<i>Branta bernicla glaucogastra</i>)	1
Jungle fowl (<i>Gallus bankiva</i>)	1	Canada goose (<i>Branta canadensis</i>)	7
English pheasant (<i>Phasianus colchicus</i>)	1	Hutchins's goose (<i>Branta canadensis hutchinsii</i>)	3
Reeves's pheasant (<i>Phasianus reevesi</i>)	1	Lesser snow goose (<i>Chen hyperboreus</i>)	2
Golden pheasant (<i>Thaumalea picta</i>)	1	Greater snow goose (<i>Chen hyperboreus nivalis</i>)	1
Silver pheasant (<i>Euplocamus nycthemerus</i>)	1	American white-fronted goose (<i>Anser albifrons gambeli</i>)	3
European quail (<i>Coturnix communis</i>)	1	Chinese goose (<i>Anser cygnoides</i>)	3
Hungarian partridge (<i>Perdix perdix</i>)	1	Scaup duck (<i>Marila marila</i>)	5
Bobwhite (<i>Colinus virginianus</i>)	3	Canvasback (<i>Marila valisneria</i>)	1
Mountain quail (<i>Oreortyx picta</i>)	2	Red-headed duck (<i>Marila americana</i>)	2
Scaled quail (<i>Callipepla squamata</i>)	2	Wood duck (<i>Aix sponsa</i>)	8
California quail (<i>Lophortyx californica</i>)	1	Mandarin duck (<i>Dendrocygna galericulata</i>)	5
Gambel's quail (<i>Lophortyx gambeli</i>)	3	Pintail (<i>Dafila acuta</i>)	4
Massena quail (<i>Cyrtonyx montezumæ</i>)	7	Shoveler duck (<i>Spatula clypeata</i>)	1
Purple gallinule (<i>Porphyrio carulea</i>)	1	Black duck (<i>Anas rubripes</i>)	1
Black-backed gallinule (<i>Porphyrio melanotus</i>)	2	Mallard (<i>Anas platyrhynchos</i>)	13
Martinique gallinule (<i>Tonornis martinicus</i>)	1	American white pelican (<i>Pelecanus erythrorhynchos</i>)	10
Florida gallinule (<i>Gallinula galeata</i>)	1	European white pelican (<i>Pelecanus onocrotalus</i>)	1
American coot (<i>Fulica americana</i>)	11	Roseate pelican (<i>Pelecanus roseus</i>)	5
Flightless rail (<i>Ocydromus australis</i>)	1	Brown pelican (<i>Pelecanus occidentalis</i>)	1
Common cariama (<i>Cariama cristata</i>)	1	Florida cormorant (<i>Phalacrocorax auritus floridanus</i>)	14
Demoiselle crane (<i>Anthropoides virgo</i>)	7	Mexican cormorant (<i>Phalacrocorax vigia mexicanus</i>)	1
Crowned crane (<i>Balearica pavonina</i>)	2	Water turkey (<i>Anhinga anhinga</i>)	5
Sandhill crane (<i>Grus mexicana</i>)	2	Roseate tern (<i>Sterna dougalli</i>)	3
Australian crane (<i>Grus australasiana</i>)	1	Royal tern (<i>Sterna maxima</i>)	4
European crane (<i>Grus cinerea</i>)	2	Black-backed gull (<i>Larus marinus</i>)	1
Sarus crane (<i>Grus antigone</i>)	1	Herring gull (<i>Larus argentatus</i>)	4
Indian white crane (<i>Grus leucogeranus</i>)	2	American herring gull (<i>Larus argentatus smithsonianus</i>)	5
Ruff (<i>Machetes pugnax</i>)	2	Laughing gull (<i>Larus atricilla</i>)	2
Black-crowned night heron (<i>Nycticorax nycticorax naevius</i>)	8		

South African ostrich (<i>Struthio australis</i>) -----	7	Common cassowary (<i>Casuarus galeatus</i>) -----	1
Somali ostrich (<i>Struthio molybdophanes</i>) -----	1	Common rhea (<i>Rhea americana</i>) -----	3
		Emu (<i>Dromæus novæ hollandiæ</i>) -----	1

REPTILES.

Alligator (<i>Alligator mississippiensis</i>) --	17	Spreading adder (<i>Heterodon platyrhinus</i>) -----	1
Sharp-nosed crocodile (<i>Crocodilus americanus</i>) -----	1	Black snake (<i>Zamenis constrictor</i>) -----	3
Painted turtle (<i>Chrysemys picta</i>) -----	4	Coach-whip snake (<i>Zamenis flagellum</i>) --	1
Diamond-back terrapin (<i>Malacoclemys palustris</i>) -----	1	Corn snake (<i>Coluber guttatus</i>) -----	1
Three-toed box-tortoise (<i>Cistudo triunguis</i>) -----	6	Common chicken snake (<i>Coluber quadrivittatus</i>) -----	1
Painted box-tortoise (<i>Cistudo ornata</i>) --	5	Gopher snake (<i>Compsosoma corais couperi</i>) -----	1
Gopher turtle (<i>Xerobates polyphemus</i>) --	1	Pine snake (<i>Pityophis melanoleucus</i>) --	4
Duncan Island tortoise (<i>Testudo ephippium</i>) -----	2	Bull snake (<i>Pityophis sayi</i>) -----	1
Albemarle Island tortoise (<i>Testudo vicina</i>) -----	1	King snake (<i>Ophibolus getulus</i>) -----	1
Horned lizard (<i>Phrynosoma cornutum</i>) --	3	Common garter snake (<i>Eutænia sirtalis</i>) -----	1
Gila monster (<i>Heloderma suspectum</i>) --	5	Texas water snake (<i>Eutænia proxima</i>) --	1
Glass snake (<i>Ophisaurus ventralis</i>) -----	1	Water moccasin (<i>Ancistrodon piscivorus</i>) -----	1
Regal python (<i>Python reticulatus</i>) -----	1	Copperhead (<i>Ancistrodon contortrix</i>) --	2
Anaconda (<i>Eunectes murinus</i>) -----	2	Diamond rattlesnake (<i>Crotalus adamanteus</i>) -----	3
Velvet snake (<i>Epicrates cenchris</i>) -----	1	Banded rattlesnake (<i>Crotalus horridus</i>) -----	1
Cuban tree-boia (<i>Epicrates angulifer</i>) --	1		

GIFTS.

Mr. Raymond Adams, Washington, D. C., an alligator.
 Dr. J. S. Billupp, Leeland, Md., an American magpie.
 Mr. M. E. Boyd, Washington, D. C., a horned lizard.
 Mr. August Busck, Washington, D. C., two marmosettes.
 Mr. W. M. Chrissinger, Hagerstown, Md., a black snake.
 Mrs. Eugenia S. Cleary, Washington, D. C., a common canary.
 Mr. Wallace Evans, Oak Park, Ill., four mink.
 Capt. W. E. P. French, Washington, D. C., an alligator.
 Mr. F. P. Hall, Washington, D. C., three alligators.
 Mr. Kidwell, Washington, D. C., a bald eagle.
 Mr. M. S. Lawrence, Washington, D. C., a common opossum.
 Mr. De Witt T. Leach, Washington, D. C., a woodchuck.
 Mr. Ralph W. Lee, Washington, D. C., an alligator.
 Miss Clare and Mr. James McCall, Mapleton, Pa., a banded rattlesnake.
 Mr. D. McLanahan, Washington, D. C., a barred owl.
 Mr. E. B. McLean, Washington, D. C., a skunk, two raccoons, and a toucan.
 Mr. J. W. Mills, Washington, D. C., an alligator.
 Mr. Victor Mindeleff, Washington, D. C., a crocodile.
 Mr. Thomas Moreland, Washington, D. C., a barn owl.
 Hon. L. P. Padgett, Columbia, Tenn., a gray coatimundi.
 Capt. A. W. Perry, Washington, D. C., a western mocking bird.
 Capt. R. B. Putnam, Washington, D. C., a gray coatimundi.
 Mr. F. J. Raymond, Washington, D. C., a green parrot.
 Dr. C. W. Richmond, Washington, D. C., two barn owls.
 Mrs. Ricketson, Washington, D. C., a common raccoon.
 Mr. Richard A. Sargent, Washington, D. C., a common canary.
 Mrs. Gurnon P. Scott, Washington, D. C., a shell parakeet.
 Mr. E. T. Seton, Cos Cob, Conn., three common skunks.
 Mr. Ellis Spear, Washington, D. C., two common canaries.
 Miss Straub, Washington, D. C., a green parrot.

Mr. H. E. Thomas, Washington, D. C., a black snake.
 Mrs. E. St. Clair Thompson, Washington, D. C., a common canary.
 Mrs. C. V. Williams, Washington, D. C., an alligator.
 Hon. Woodrow Wilson, Washington, D. C., a horned lizard.
 The Zoological Society of Philadelphia, six muskrats.
 Unknown donors, a screech owl, five barn owls, an English pheasant, and an alligator.

LOSSES OF ANIMALS.

The most serious loss was among the ruminants. An eland, a bontebok, a Coke's hartebeest, and a harnessed antelope died from tuberculosis; a moose and a reindeer from enteritis; two tahr goats from pneumonia; and an American bison, 21 years old, from arteriosclerosis. A fur seal also died from enteritis and a grizzly bear that when captured, 19 years before, weighed 730 pounds was killed because of its general decrepitude. A number of birds were lost through the depredations of raccoons and other animals living at large in the park. The night herons had increased to such an extent in the flying cage that they interfered with the nesting of other birds there, and the greater part of them (114) were disposed of, a few as gifts to other zoological collections.

Of animals that died in the park, 107 were transferred to the National Museum. Autopsies were made as heretofore by the Pathological Division of the Bureau of Animal Industry, Department of Agriculture.¹

STATEMENT OF THE COLLECTION.

ACCESSIONS DURING THE YEAR.

Presented	66
Purchased	162
Born and hatched in National Zoological Park	78
Received in exchange	18
Deposited in National Zoological Park	6
Captured in National Zoological Park	1
Total	331

SUMMARY.

Animals on hand July 1, 1912	1,551
Accessions during the year	331
Total	1,882
Deduct loss (by exchange, death, return of animals, etc.)	414
On hand June 30, 1913	1,468

¹The causes of death were reported to be as follows: Enteritis, 37; gastritis, 1; impaction of bowel, 3; pneumonia, 14; tuberculosis, 10; congestion of lungs, 4; aspergillosis, 4; malignant catarrh of nose and throat, 1; inflammation of pharynx and larynx, 1; congestion of liver, 1; septicemia, 3; sarcoma, 1; abscess, 1; gangrene of thyroid gland, 1; generalized fat necrosis, 1; arteriosclerosis, 1; umbilical infection, 1; starvation (snakes), 3; killed because of arthritis, 1, and of senile debility, 1; accidents (killed by animals, etc.), 32; no cause found (only viscera examined in most cases), 12.

Class.	Species.	Individuals.
Mammals.....	154	606
Birds.....	202	786
Reptiles.....	31	76
Total.....	387	1,468

VISITORS.

The number of visitors to the park during the year, as determined by count and estimate, was 633,526, a daily average of 1,731. This was nearly 100,000 more than during the fiscal year 1912. The largest number in any one month was 120,908, in March, 1913, an average per day of 3,900.

During the year 142 classes, schools, etc., with a total of 5,579 pupils, visited the park, a monthly average of 465. These were mainly from the District of Columbia and neighboring States, but other States, from Vermont, New Hampshire, and Massachusetts, to Tennessee and South Carolina, were represented, and "Corn Growers" belonging to 18 States.

IMPROVEMENTS.

The construction of a house for the storage and preparation of food, which was begun toward the close of the previous year, was completed early in this year and equipped with a large range for cooking and baking, a small cold-storage room, dumb-waiter, etc. The total cost of building and equipment was \$3,615, of which \$3,050 was paid from this year's appropriation. The building is of stone, 24 feet wide and 40 feet long, and has one story and a basement, both with concrete floors. It is abundantly lighted and thoroughly sanitary. It is located at the rear of the temporary bird house, so that the building and the yard about it are screened from public view, while still convenient of access. This improvement had been much needed, as the only place previously available for the preparation of food was the cellar of the lion house, where both light and ventilation were far from satisfactory.

An inclosure and shelter house were built between the lion house and the small-mammal house to afford temporary quarters for the small flock of ostriches recently acquired. The house is 16 feet wide and 24 feet long, and the adjoining inclosure, which is nearly circular, is about 100 feet in diameter.

A new inclosure, with a pool, for wood ducks and nearly related species, was built in the valley near the flying cage.

The suspension footbridge across Rock Creek near the northern entrance to the park having become unsafe, a new bridge of similar construction was built there.

A bridle path was laid out near the bank of the creek throughout its entire length in the park, and a rustic walk, mainly parallel to the roadway, was built from the concrete bridge to the north entrance.

Early in the year the first section of a retaining wall was built in the ravine opposite the point at which Ontario Road reaches the park, and later a second section was built above this, giving the wall a total height of 18 feet.

A small retaining wall was built, also, at the mouth of the little run at the northern edge of the park near Klinge Road to prevent further erosion there and protect valuable forest trees which are being undermined.

A small amount of riprapping was done at three places on the banks of the creek.

Just before the close of the year work was begun on the old elephant barn to fit it and the adjoining yard, then occupied by tapirs, for the temporary accommodation of the two young African elephants which had been secured from the zoological garden at Giza. A new yard, with a pool, for the tapirs was built next to the new elephant house, the work on this being well under way at the close of the year.

The cost of these improvements was as follows:

Food house (from 1913 appropriation)-----	\$3, 050
Inclosure and shelter for ostriches-----	450
Inclosure and pool for wood ducks-----	200
New suspension footbridge-----	400
Bridle path and rustic walk-----	775
Retaining wall at Ontario Road-----	425
Retaining wall near Klinge Road-----	175
Riprapping banks of creek-----	275
Alterations of old elephant barn and inclosure-----	850
Total-----	\$6, 600

Through the generosity of Mr. John B. Henderson, jr., there was completed in the autumn of 1912 an outdoor cage for parrots which had heretofore been confined in the bird house. The cage is 24 by 40 feet, and about 26 feet high, has a steel framework and is covered with strong wire netting of special construction. Several species of cockatoos and macaws, and one species of Amazon parrot, in all 28 specimens, were placed in the cage, and, with few exceptions, have been thrifty and appear to enjoy their outdoor freedom.

MAINTENANCE OF BUILDINGS, INCLOSURES, ETC.

It was necessary to make quite extensive repairs during the year, so that the expenditures for upkeep were somewhat larger than usual. New concrete floors were laid in two of the largest bear yards, and the pools rebuilt. The concrete base of the partitions between the

several yards was also built up sufficiently to bring the metal work of the partitions above the damp floor.

A section of the boundary fence of the park was largely rebuilt and other portions repaired, and much of the metal work of cages and inclosures was repainted, including the flying cage and eagle cage, bear yards, antelope yards, and the outside cages of the small-mammal house.

NEW BRIDGE ACROSS ROCK CREEK.

The sundry civil act for the fiscal year ending June 30, 1913, contained the following item: "For the construction of a rough-stone faced or boulder bridge across Rock Creek to replace the present log bridge on the line of the roadway from Adams Mill Road entrance and Cathedral Avenue, \$20,000." The act also includes the following provisions: "Hereafter all plans and specifications for the construction of buildings in the National Zoological Park shall be prepared under the supervision of the municipal architect of the District of Columbia, and all plans and specifications for bridges in said park shall be prepared under the supervision of the engineer of bridges of the District of Columbia."

In accordance with this requirement the matter of preparing plans and specifications for the bridge was taken up with the engineer of bridges very soon after the sundry civil act was approved (August 24, 1912). A considerable amount of preliminary work had already been done when the engineer of bridges died. The matter was taken up again with his successor and plans and specifications were prepared and advertisements made for proposals April 28, 1913. A contract for the construction of the bridge was entered into May 29, 1913. The old bridge was removed as soon as possible, and work on the new bridge was begun about the middle of June. The bridge is to be of reinforced concrete, faced with rough blocks of the blue gneiss found in this region. Stone for the concrete is to be obtained in the park. The span of the bridge is to be 80 feet and the total length at the road level 114 feet. The bridge will be 39 feet 6 inches wide from outside to outside, with a width of 36 feet 6 inches between the parapets. There will be a macadam roadway with concrete sidewalk on either side, but the construction of roadway and sidewalks will be deferred until the earth fill has thoroughly settled. The work on the main portion of the bridge covered by the contract will amount to about \$10,800, while the cost of material furnished by the park, preparation of plans, superintendence, and other expenses will probably bring the total cost up to \$15,300. The appropriation, therefore, will be sufficient to add wing walls if desirable, and to complete the approaches. It is expected that all work under the contract will be

finished and the temporary roadway built in time to open the bridge for use by October 30. It has been necessary to close the road to vehicles during the construction of the bridge.

Most of the members of the old log bridge, which was erected in 1896, were found to be in surprisingly good condition, but it was so much decayed at some vital points as to be dangerous for use.

ALTERATION OF THE WEST BOUNDARY OF THE PARK.

In the last annual report, as in several previous reports, attention was called to the urgent need of acquiring additional land along the western side of the park and the great desirability of extending the park to Connecticut Avenue. The matter was presented to Congress and an appropriation has been made for the purchase of the privately owned land lying between the western boundary of the park and Connecticut Avenue from Cathedral Avenue to Klinge Road, the land in the included highways also to become a part of the park. The land to be purchased amounts to about ten and two-thirds acres and that in the highways to about two and two-thirds acres.

Respectfully submitted.

FRANK BAKER, *Superintendent.*

Dr. CHARLES D. WALCOTT,

Secretary of the Smithsonian Institution,

Washington, D. C.

APPENDIX 5.

REPORT ON THE ASTROPHYSICAL OBSERVATORY.

SIR: I have the honor to present the following report on the operations of the Smithsonian Astrophysical Observatory for the year ending June 30, 1913:

EQUIPMENT.

The equipment of the observatory is as follows:

(a) At Washington there is an inclosure of about 16,000 square feet, containing five small frame buildings used for observing and computing purposes, three movable frame shelters covering several out-of-door pieces of apparatus, and also one small brick building containing a storage battery and electrical distribution apparatus.

(b) At Mount Wilson, Cal., upon a leased plot of ground 100 feet square, in horizontal projection, are located a one-story cement observing structure, designed especially for solar-constant measurements, and also a little frame cottage, 21 feet by 25 feet, for observer's quarters.

During the year there was erected upon the observing shelter at Mount Wilson a tower 40 feet high above the 12-foot piers which had been prepared in the original construction of the building. This tower is now being equipped as a tower telescope for use when observing (with the spectrobolometer) the distribution of radiation over the sun's disk. The cost of the tower and its apparatus has thus far been about \$1,400.

Other pieces of apparatus for research have been purchased or constructed at the observatory shop. The value of these additions to the instrumental equipment, not counting the tower above mentioned and its equipment, is estimated at \$1,500.

WORK OF THE YEAR.

1. ON THE SOLAR CONSTANT OF RADIATION.

When Volume II of the Annals of the Astrophysical Observatory was published in 1908 the standard scale of measurement of solar radiation had not yet been established. Several supposedly standard pyrheliometers for the purpose of fixing the true scale of radiation

measurement were constructed and tried at this observatory, as mentioned in former reports. The results obtained agreed closely together and were checked by observations with known quantities of heat. In October, 1912, another type of standard pyrheliometer, which we called the water-stir pyrheliometer, was devised, constructed, and used. It proves to give values for the standard scale of radiation almost identical with those which we had before obtained, and in this instrument, as in the others, known test quantities of heat were introduced and measured within less than 1 per cent. In view of all these experiments with standard pyrheliometers, it is now felt that the standard scale of radiation is at length fully established. Accordingly, a publication entitled "Smithsonian Pyrheliometry Revised" was issued February 1, 1913, giving the results of all the definitive experiments on the standard scale of radiation and also the experiments made to fix the scales of all the secondary pyrheliometers in use at the Astrophysical Observatory or furnished by the Smithsonian Institution to observers in this country and abroad.

A small correction in the determinations of the solar constant of radiation made at Mount Wilson and elsewhere was found to be required owing to a residual effect of water vapor in the atmosphere which had not been entirely eliminated. This correction sometimes reaches as great a magnitude as 2 per cent. It has now been applied to all the measurements made at the various stations which have been occupied since 1902, and all the solar-constant measurements, about 700 in number, have been reduced to the new standard scale of pyrheliometry.

The mean value of the solar constant of radiation at the earth's mean distance from the sun from about 700 measurements, some at Washington, others at Mount Wilson, others at Bassour, Algeria, and still others at Mount Whitney, Cal., and covering the years from 1902 to 1912, has now been taken. *It is 1.932 calories per square centimeter per minute.*

2. THE VARIABILITY OF THE SUN.

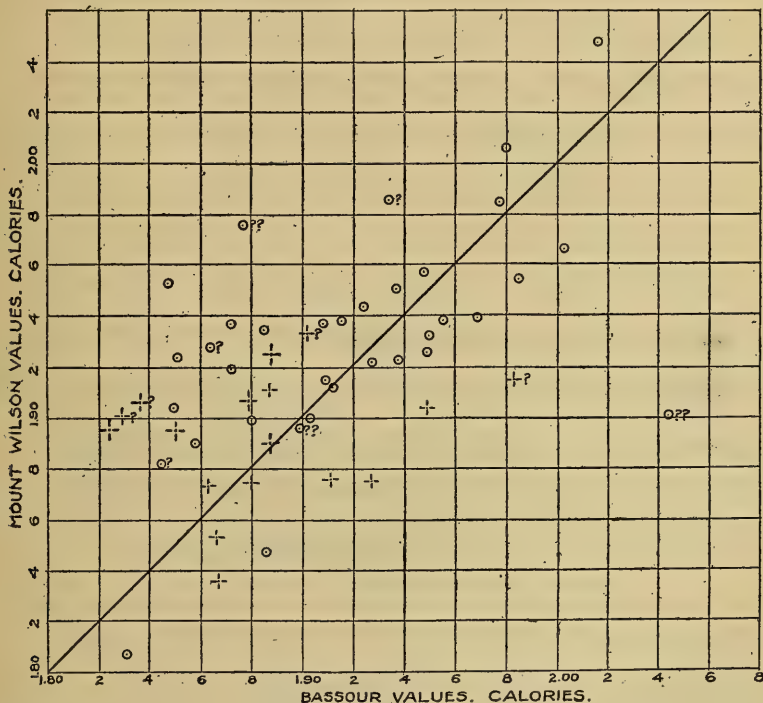
(a) *Attending sun spots.*

In connection with the reduction of the measurements of the solar constant of radiation mentioned above, mean values were taken for each month during which observations had been made at Mount Wilson. These monthly mean values, extending from the year 1905 to the year 1912, have been compared with the so-called Wolff sun-spot numbers for the same months. The result shows, as indicated in the accompanying illustration, that increased solar-constant values attend increased sun-spot numbers. An increase of radiation at the earth's mean distance from the sun of 0.07 caloric per square

centimeter per minute appears to attend an increased spottedness of the sun represented by 100 Wolff sun-spot numbers.

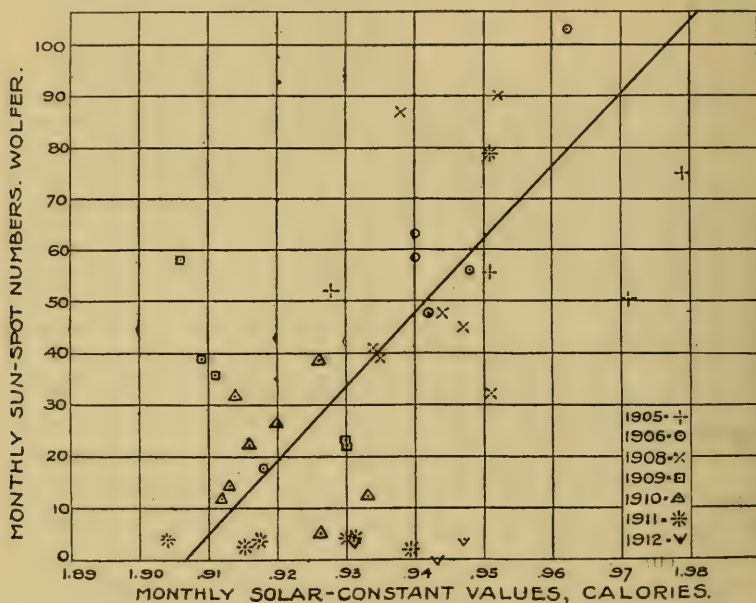
(b) *Short interval irregular variability.*

The observations which had been begun in the year 1911 and continued in the year 1912 at Bassour, Algeria, simultaneously with similar observations at Mount Wilson, Cal., were concluded in September, 1912. The observations obtained at the two stations have



now been completely reduced and compared. The results given in the accompanying diagram show conclusively that if high values of the solar radiation (outside the atmosphere) are found from California observations, the values found from Algerian observations will be high also, and vice versa. In other words, the fluctuation of the "solar-constant" values which had been found in California in former years are now shown to be no local phenomenon due, perhaps, to atmospheric disturbances, but rather a phenomenon which is general over the earth's surface and which must be attributed to causes outside the earth altogether. It would be conceivable that such a cause might be the interposition of meteoric dust or other matter between the earth and the sun; but other evidence, which is more fully explained in Volume III of the Annals of the Astro-

physical Observatory, shows that we must attribute the changes to the sun itself and not to the interposition of matter between the earth and the sun. Thus we may conclude that the sun is variable, having not only a periodicity connected with the periodicity of sun spots, but also an irregular, nonperiodic variation, sometimes running its course in a week or 10 days, at other times in longer periods, and ranging over irregular fluctuations of from 2 to 10 per cent of the total radiation in magnitude.



3. THE EFFECTS OF VOLCANIC ERUPTIONS.

Violent eruption of Mount Katmai, Alaska, occurred on June 6, 7, and 8, 1912. The solar observations made at Bassour, Algeria, and at Mount Wilson, Cal., began to indicate the presence of dust in the upper air from this volcano about June 20, 1912. The effects of this dust became more and more considerable, so that in August the direct radiation of the sun was reduced by the interposition of the dust cloud by about 20 per cent, both at Bassour and Mount Wilson. A study of the influence of Mount Katmai and other volcanic eruptions was published by Messrs. Abbot and Fowle in the Smithsonian Miscellaneous Collections, volume 60, No. 29, 1913. It was shown that not only the volcano of Mount Katmai, but also other great eruptions of former years, have materially decreased the direct radiation of the sun, and apparently altered the temperature of the earth. Various observers have shown that the presence of sun spots is attended with a decreased terrestrial temperature. In the paper just mentioned it is shown that quite as important an

influence is attributable to the presence of volcanic haze; and that a combination of the effects of sun spots and volcanic haze accounts for all the principal outstanding irregularities in the temperature of the earth for the last 30 years.

4. VOLUME III OF THE ANNALS OF THE ASTROPHYSICAL OBSERVATORY.

The principal work of the year was the reduction of observations and the preparation for publication of Volume III of the Annals of the Astrophysical Observatory. (Quarto; pp. XI+241; tables, 70; inserted plates, 7; text figures, 32.) The manuscript was forwarded to the Public Printer on April 1, and the first completed copy of the book was received on July 3, 1913. About 1,400 copies have been distributed to libraries and individuals throughout the world.

In brief, the experiments described therein, which include the work of the observatory from 1907 to 1913, appear—

(a) To have established the scale of measurement of radiation to within 1 per cent.

(b) To have established the solar constant of radiation to within 1 per cent.

(c) To have shown by two independent methods that the sun's emission is not uniform but varies with an irregular periodicity of from 7 to 10 days on the average and with irregular amounts seldom if ever exceeding 10 per cent.

(d) To have shown that the sun also varies in connection with the sun-spot cycle. The solar emission appears to be increased at the earth's mean distance from the sun by about 0.07 of a calorie per square centimeter per minute for an increase of 100 Wolff sun-spot numbers.

(e) A marked effect of volcanic dust in the upper atmosphere on the radiation of the sun and on the temperature of the earth is indicated.

(f) Studies of the radiation of the sky, the effects of water vapor on the solar radiation, the distribution of radiation over the sun's disk, the probable temperature of the sun, and other subjects are included.

5. STUDIES OF THE TRANSMISSION OF LONG WAVE RAYS BY WATER VAPOR IN THE EARTH'S ATMOSPHERE.

Mr. Fowle's experiments on the transmission of radiation through long columns of air containing measured quantities of water vapor were temporarily discontinued owing to the need of completing the publication of Volume III of the Annals. He, however, published a paper on the quantity of water vapor found above the Mount Wilson station.¹

Toward the end of the fiscal year a vacuum bolometer was prepared for use in continuing the experiments on the transmission of

¹ Astrophysical Journal, vol. 37, p. 359, 1913.

very long wave rays through atmospheric water vapor. It is proposed to push this work in the immediate future.

G. THE CALIFORNIA EXPEDITION.

A grant of money from the Hodgkins fund having been made by the Institution to Mr. A. K. Ångström for observations of nocturnal radiation at different altitudes, several other lines of investigation were arranged to be included in connection with these researches. In the first place measurements were proposed on the total radiation from the sky by day. For this purpose and with the aid of a small grant from the Hodgkins fund Mr. Abbot devised and tested a special sky-radiation apparatus. This instrument comprises two blackened strips of metal, which are exposed successively at the centers of two metal plates in such a way that the whole hemisphere of the sky is free to shine on the exposed blackened strip, but nothing can come from below the horizon toward the strips. Each strip is at the center of a hemispherical glass inclosure, which serves the purpose of preventing the exchange of rays of long-wave lengths (associated with the temperature of such objects) between the blackened strip and the sky. Thus the apparatus serves to measure the quantity of radiation, originally coming from the sun, which has become diffusely scattered toward the horizontal surface by the molecules and dust particles found in the atmosphere.

Secondly, in order to determine the temperature and humidity prevailing above the stations occupied by Mr. Ångström's expeditions, the Institution procured a large number of sounding balloons, and arrangements were made with the Weather Bureau for flying these balloons from Santa Catalina Island, carrying with each ascension self-recording apparatus of the Weather Bureau for measuring the temperature, pressure, and humidity of the air. Captive balloons belonging to the Weather Bureau were also arranged to be sent up at Lone Pine, Cal., and at Mount Whitney, Cal., while Mr. Ångström was occupying these two stations.

As certain writers have expressed doubt whether measurements of the solar constant of radiation made by Langley's method of high and low observations with the spectrolometer really furnish the solar radiation values as they would be found outside our atmosphere, it seemed desirable to check these results by observing at the highest possible altitudes the actual intensity of the solar radiation. For this purpose Mr. Abbott designed a form of pyrliometer, similar in principle to the silver-disk pyrliometer, but which is automatic and self-recording, and can be attached to a sounding balloon, and thus carried to very great heights. Five copies of this instrument were prepared at the observatory shops by Mr.

Kramer and Mr. Abbot, and these were sent with the expedition to California. In anticipation it may be said that the five instruments were sent up on successive days, beginning July 30, 1913, and at the time of writing this report two of them have been recovered. Each of the two had a readable record of the ascension. A preliminary reduction of the results shows that, beginning at an altitude of about 6,000 meters and separated by altitude intervals of 2,000 or 3,000 meters for successive exposure, four determinations of the solar radiation were obtained in each of the ascents. The rough computation mentioned results as follows: First ascent: 1.44, 1.60, 1.70, and 1.88 calories per square centimeter per minute. Second ascent: 1.62, 1.64, 1.76, and 1.89 calories per square centimeter per minute.

These results are subject to later recomputation, but they indicate at least that our solar-constant work of 1902-1912 by high and low sun observations on homogeneous rays, according to Langley's methods, gives results of the same order of magnitude as those obtained by direct pyrheliometric observations at extremely high altitudes.

PERSONNEL.

No change has occurred in the staff of the observatory, except that Miss F. E. Frisby completed her temporary service as computer on June 30, 1913, and Mr. A. K. Ångström served as temporary bolometric assistant in Algeria from July 1, 1912, to September 30, 1912.

SUMMARY.

The work of the observatory has been uncommonly successful. Volume III of its Annals has been published, including the work of the years 1907 to 1912. The observations at Bassour, Algeria, taken in connection with those made simultaneously at Mount Wilson, Cal., have established the variability of the sun. A variability connected with the sun-spot cycle has also been shown. The mean value of the solar constant of radiation has been fixed, it is thought, within 1 per cent. From about 700 observations, extending over the time interval from 1902 to 1912 and taken at different altitudes from sea level to 4,420 meters, the mean value is 1.932 calories per square centimeter per minute. Pyrheliometers have been sent up by means of sounding balloons to very great altitudes, and preliminary results indicate that they give values of the solar radiation similar to those found by high and low sun observations on homogeneous rays.

Respectfully submitted.

C. G. ABBOT,

*Director Astrophysical Observatory,
Smithsonian Institution.*

DR. CHARLES D. WALCOTT,

Secretary of the Smithsonian Institution.

APPENDIX 6.

REPORT ON THE LIBRARY.

SIR: I have the honor to submit the following report on work performed for the Smithsonian Library during the fiscal year ending June 30, 1913:

ACCESSIONS.

The accessions to the library are obtained mainly by exchange of its own publications, or by gift. During the fiscal year 1913, 33,161 packages of publications were received as exchanges and gifts, of which 29,065 packages were transmitted by mail and 4,096 through the International Exchange Service. In addition to letters written in acknowledgement of publications received in response to the requests of the Institution for exchange, some 5,000 publications were acknowledged on the regular printed forms.

The following number of accessions for the Smithsonian deposit in the Library of Congress were recorded during the year: 3,379 volumes, 1,407 parts of volumes, 5,990 pamphlets, and 450 charts; total, 11,226 publications. The numbers in the accession catalogue ran from 508,789 to 513,026, the parts of serial publications entered on the card catalogue numbered 21,081,¹ and 1,256 slips were prepared for completed volumes. The various publications sent to the Library of Congress as soon as received and entered filled 257 boxes and comprised 30,350 separate pieces, including parts of periodicals, pamphlets and complete volumes. Besides these, about 1,704 parts of serials needed to complete sets were obtained by exchange and sent to the Library of Congress separately.

As in previous years, public documents presented to the Institution were sent to the Library of Congress without being stamped or recorded. Publications of this class to the number of 9,866 were transmitted in this manner during the year.

The Smithsonian Office Library and the small collections of books maintained by the Astrophysical Observatory and the National Zoological Park received accessions amounting altogether to 573, divided as follows: Smithsonian Office, 314 volumes, 37 parts of vol-

¹ Only a portion of these are included in the foregoing statistics of accessions, as periodicals are not entered in the accession record until volumes are complete.

umes, and 19 pamphlets; Astrophysical Observatory, 90 volumes, 21 parts of volumes, and 69 pamphlets; National Zoological Park, 13 volumes and 10 pamphlets.

EXCHANGES.

Through correspondence, 140 new periodicals were added during the year to the great collection of scientific journals contained in the Smithsonian deposit, together with 1,704 parts needed to complete volumes in the various series.

The matter of the completion of sets in the Smithsonian deposit received special attention. Revised want lists for Belgium, Denmark, France, Germany, the Netherlands, Norway, Sweden, and Switzerland were taken up, and, so far as possible, the needed parts were supplied. These lists were additional to the regular want cards received separately from the Library of Congress. As a result of the work carried on in this direction during the year, 192 parts of 60 different publications were sent to the Library of Congress to complete sets of periodicals in the Smithsonian deposit and 1,475 missing parts needed to complete volumes of 173 different series of publications of learned societies and scientific institutions. For other divisions of the Library of Congress 37 parts of 16 sets were supplied.

In exchange for annual reports of the American Historical Association a number of publications of European historical societies were obtained for the library, as in previous years.

READING ROOM.

The rearrangement of the reading room in the Smithsonian building mentioned in last year's report was completed. Two new oak tables have been provided, a large one for readers and a smaller one with bins for periodicals. All the doors have been removed from the cases of pigeonholes for periodicals which stand against the walls and proper space made for desks and aisles. By these changes the appearance of the room has been much improved and the periodicals made more readily accessible. The latest issues of about 262 domestic and foreign scientific periodicals are now constantly at hand and are consulted by the staff of the Institution and its branches, the scientific officers of various governmental establishments in Washington, and students generally. The series of large accession books formerly kept in the reading room have been removed to the adjoining office and placed in a special case. A partial rearrangement of the contents of the room farther to the east was effected during the year for the purpose of making the encyclopedias, dictionaries, gazetteers, and other books of general reference more readily accessible. This room contains the transactions of the vari-

ous academies of the world and other similar series which are constantly needed for reference by the scientific staff of the Institution.

AERONAUTICAL LIBRARY.

The Institution possesses an excellent collection of literature relating to the subject of aeronautics, which is kept in the room last mentioned. This very valuable series of publications is rich in periodicals, especially those of early date. During the year all the books were reclassified and the volumes of periodicals were collated and made ready for binding.

ART ROOM AND EMPLOYEES' LIBRARY.

No additions to the works on art contained in this room were made during the year and the arrangement remained unchanged. All works relating to other subjects than art have been eliminated, and those properly belonging in the room are in good condition and readily accessible.

No changes were made in the small collection of general literature known as the employees' library for the reasons mentioned in last year's report.

NEW STEEL BOOKSTACKS.

The estimates for the fiscal year 1914 contained an item of \$40,000 for the erection of metal bookstacks in the main hall of the Smithsonian building, to contain the library of the Bureau of American Ethnology, a part of the National Museum library, together with books belonging to other branches of the Institution, and certain collections of Smithsonian books used by the scientific and administrative staff. Toward the close of the fiscal year covered by this report Congress appropriated the sum of \$15,000 for beginning this work, and arrangements were immediately made to secure a design for the bookstacks. In accordance with the plan proposed, a floor space at each end of the hall measuring 50 feet by 26 feet will be devoted to the stacks, which will be arranged in three tiers and reach from the floor to the ceiling. In order to increase the shelf capacity and at the same time preserve the appearance of the hall, a series of bookcases about 8 feet high will be carried along the north and south walls, connecting with the stacks at each end. The object of this arrangement is to concentrate the various collections of books as far as practicable and at the same time to preserve the symmetry of the hall, and to leave the central portion open for exhibits and for various Smithsonian gatherings. A portion of the space will probably be needed for the preservation and display of the personal relics of James Smithson and for objects illustrating the work of the several branches of the Institution.

CATALOGUE OF SMITHSONIAN PUBLICATIONS.

A contract was entered into during the year for the preparation of a complete catalogue of the publications of the Institution and its branches in book form. It is expected that the manuscript will be finished within a few months and that means will be found to print and issue the catalogue without serious delay.

LIBRARIES OF THE GOVERNMENT BRANCHES.

United States National Museum.—In accordance with the plans approved last year, four rooms at the northeast corner of the new building of the National Museum on the ground floor (Nos. 24, 26, 27, and 28) were fitted with steel bookstacks and other library appliances of the latest design for the reception of the portion of the Museum library needed in connection with the study and classification of the natural history and other collections in that building. The three rooms on the north side of the corridor not being separated by partitions, the entire space of 107 feet by 21 feet was divided into three portions of unequal dimensions, the western portion being assigned for a general reading room, and also for the card catalogues, reference books, charging desk, etc. The middle portion, of smaller dimensions, for quiet reading; and the larger eastern portion for the general stacks. The stacks are in two tiers separated by a glass floor. In the middle room the arrangement is similar, except that a large table occupies the central floor space. A gallery which extends around three sides of the general reading room also supports stacks, and on the ground floor additional shelving occupies the east wall of this room. Open shelves for current numbers of periodicals occupy the space under the windows. Two steel manuscript cases have been placed in the middle room, and a small lift for raising books to the upper or mezzanine floor, and suitable staircases have also been provided. A special feature of the stack room is that every second stack is but $3\frac{1}{2}$ feet high instead of 7 feet. This arrangement reduces the total shelf capacity a little, but provides a place on which to lay books when they are being rearranged or used by readers. As the members of the staff and other students are permitted to consult books in the stack room, the provision is a necessary one.

The room on the south side of the corridor (No. 27) was arranged as an office for the assistant librarian and the cataloguers. Bookstacks extend around the walls of the room on three sides, and there are two additional stacks, dividing the room practically into three.

The steel stacks were completed about October 15, 1912, and the moving of books from the old quarters was begun immediately. The task of placing the books on the new shelves occupied about a month,

during which time they were, nevertheless, available for use by readers and the delivery of books to the sectional libraries was not interrupted. For moving, the books were tied together in lots of convenient size for handling, and each lot received a number. It was then a simple matter to put the books in their proper places on the shelves in the new library. After they were in place, the library was fortunately able to employ temporary assistants to go over them all for the purpose of checking up the various series and ascertaining whether the volumes were all present and in their proper sequence.

The arrangement of the cards belonging to the Zurich catalogue of scientific literature has been perfected, and they are now available for reference.

In accordance with the plans decided upon, as mentioned in last year's report, the books on museum administration, technology, history, botany, and some other subjects were allowed to remain in the old quarters, where they would be most readily accessible to the members of the staff and others working in those lines. It is the intention, however, to transfer the botanical books to the new stacks in the Smithsonian Building as soon as the latter shall have been completed.

This portion of the library was rearranged and recatalogued as rapidly as possible, and with the aid of additional help the publications had been classified on the shelves at the close of the year and about one-half of them recatalogued. The following work in this direction was accomplished during the year: Books catalogued, 1,370; pamphlets, 2,416; total number of cards made, 3,132. Completed volumes of periodicals catalogued, 2,938; parts of publications, 19,059; total number of cards made, 1,117.

During the year 881 volumes were prepared for binding and sent to the Government bindery for that purpose.

Many important gifts were received by the library during the year, and the following members of the staff presented publications: Secretary Charles D. Walcott, Dr. Theodore N. Gill, Dr. William H. Dall, Mr. Robert Ridgway, Dr. C. W. Richmond, Dr. J. C. Crawford, Dr. O. P. Hay, and Mr. W. R. Maxon.

The Museum library now contains 43,692 volumes, 72,042 unbound papers, and 122 manuscripts. The accessions during the year covered by this report consisted of 1,690 books, 2,213 pamphlets, and 159 parts of volumes. The number catalogued, exclusive of those mentioned above, was as follows: 782 books, 892 complete volumes of periodicals, and 2,229 pamphlets.

The number of books, periodicals, and pamphlets borrowed from the general library amounted to 25,846, among which were 3,888 obtained from the Library of Congress, 117 from the Department of

Agriculture, 71 from the Army Medical Museum and library, 59 from the United States Geological Survey, and 19 from other libraries. Publications to the number of 4,832 were assigned to the sectional libraries of the Museum during the year.

The following is a complete list of the sectional libraries now existing:

Administration.	Marine invertebrates.
Administrative assistant's office.	Materia medica.
Anthropology.	Mechanical technology.
Biology.	Mollusks.
Birds.	Oriental archeology.
Botany.	Paleobotany.
Comparative anatomy.	Parasites.
Editor's office.	Photography.
Ethnology.	Physical anthropology.
Fishes.	Prehistoric archeology.
Geology.	Reptiles and batrachians.
Graphic arts.	Superintendent's office.
Insects.	Taxidermy.
Invertebrate paleontology.	Textiles.
Mammals.	Vertebrate paleontology.

The records of the Museum library consist of an author's catalogue, an accession book, a periodical record on standard cards, and a lending record. This lending record is on cards and includes books borrowed from the Library of Congress and other libraries for the use of the staff.

The library is largely dependent upon the exchange of Museum publications as a means of increase. During the year many letters asking for missing parts and for new exchanges were sent out, and a number of sets were completed in this way and new publications also added to the library.

Bureau of American Ethnology.—The report on this library will be made by the ethnologist in charge and incorporated in his general report on the operations of the bureau.

Astrophysical Observatory.—The small collection of books constituting the reference library of the Astrophysical Observatory was rearranged in the cases in the main hall of the Smithsonian Building, to which they were transferred from one of the tower rooms. During the year 90 volumes, 21 parts of volumes, and 69 pamphlets were received. This collection of books will eventually be placed in the new steel stacks, for which an appropriation was made at the last session of Congress.

National Zoological Park.—A small number of books on zoological subjects are kept in the office of the superintendent of the park. During the year 13 volumes and 10 pamphlets were added.

SUMMARY OF ACCESSIONS.

The following statement summarizes all the accessions during the year, except those made to the library of the Bureau of American Ethnology:

To the Smithsonian deposit in the Library of Congress, including parts to complete sets (see p. 94)-----	12,930
To the Smithsonian office, Astrophysical Observatory, and Zoological Park-----	573
To the United States National Museum-----	4,062
Total-----	17,565

Very respectfully,

F. W. TRUE,
*Assistant Secretary, in charge
of Library and Exchanges.*

Dr. CHARLES D. WALCOTT,
Secretary of the Smithsonian Institution.

APPENDIX 7.

REPORT ON THE INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE.

SIR: I have the honor to submit the following report on the operations of the United States Bureau of the International Catalogue of Scientific Literature for the year ending June 30, 1913.

The International Catalogue of Scientific Literature now consists of 33 regional bureaus, a new bureau representing the Argentine Republic having been recently established at the Universidad de Buenos Aires. It appears probable that Bolivia will soon also be represented by a regional bureau. The following-named countries are represented by regional bureaus supported in most cases by direct governmental grants: Argentine Republic, Austria, Belgium, Canada, Cuba, Denmark, Egypt, Finland, France, Germany, Greece, Holland, Hungary, India and Ceylon, Italy, Japan, Mexico, New South Wales, New Zealand, Norway, Poland, Portugal, Queensland, Russia, South Africa, South Australia, Spain, Straits Settlements, Sweden, Switzerland, United States of America, Victoria and Tasmania, and Western Australia.

These bureaus, acting through the London Central Bureau, form the organization of the International Catalogue of Scientific Literature, whose duty it is to collect, index, classify, and publish a current catalogue of the world's scientific literature. The London Central Bureau assembles, edits, and publishes the classified references supplied by the regional bureaus.

The enterprise was begun in 1901 and since then there have been published annually 17 volumes, one each year for the following-named branches of science: Mathematics, mechanics, physics, chemistry, astronomy, meteorology, mineralogy, geology, geography, paleontology, general biology, botany, zoology, anatomy, anthropology, physiology, and bacteriology.

All of the first 9 annual issues of the catalogue have been published, 14 volumes of the tenth issue, and 2 volumes of the eleventh, a total of 169 regular volumes in addition to several special volumes of Schedules and Lists of Journals.

The annual subscription price for a complete set of 17 volumes is \$85. The receipts from the sale of the catalogue are used for the maintenance of the central bureau, which pays for editing and printing the catalogue. The balance sheet for the ninth annual issue showed a credit for that issue of about \$1,500 over and above expenses. This is considered a satisfactory showing in view of the fact that undertakings of this kind are in no sense commercial and can hardly be expected to meet necessary expenses without aid from an endowment or some similar source. The enterprise was begun without a working capital other than the sums advanced from time to time by the Royal Society of London. As interest is paid on all sums so advanced the financial showing is not what it would have been had the enterprise possessed a working capital. The sum needed to completely pay off all obligations and leave a substantial balance for the maintenance of the central bureau is only about \$75,000, and it would be difficult to find an object more deserving of assistance and encouragement than this International Catalogue of Scientific Literature whose purpose is to aid research and investigations in scientific fields by furnishing a current classified index to the literature of science. Some idea of the extent of the work may be gained from the fact that about two and one-half million classified citations were received by the central bureau from the regional bureaus since the beginning of the enterprise in 1901, of these over 290,000 were prepared by the regional bureau of the United States.

During the year 27,995 cards were sent from this bureau to the London Central Bureau, as follows:

Literature of—

1902-----	9
1903-----	5
1904-----	12
1905-----	14
1906-----	131
1907-----	226
1908-----	324
1909-----	685
1910-----	3, 214
1911-----	6, 950
1912-----	16, 425
Total-----	27, 995

The following table shows the number of cards sent each year as well as the number of cards representing the literature of each year from 1901 to 1912, inclusive:

Literature of—	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	Total for year.
Year ending June 30—													
1902.....	6,990												6,990
1903.....	6,150	8,330											14,480
1904.....	3,044	9,424	8,745										21,213
1905.....	1,619	2,780	11,143	8,640									24,182
1906.....	301	622	3,538	12,139	9,001								25,601
1907.....	384	511	862	5,272	9,022	12,578							28,629
1908.....	408	523	366	956	5,629	7,217	13,429						28,528
1909.....	133	235	373	309	1,656	4,410	8,509	18,784					34,409
1910.....	72	173	248	465	1,163	1,502	3,160	6,305	11,994				25,082
1911.....	3	26	28	218	129	374	423	1,301	8,836	14,682			26,020
1912.....			4	243	386	562	1,480	1,949	3,372	5,231	13,974		27,201
1913.....		9	5	12	14	131	226	324	685	3,214	6,950	16,425	27,995
Total.....	19,104	22,633	25,312	28,254	27,000	26,774	27,227	28,663	24,887	23,127	20,924	16,425	290,330

Control over the catalogue is vested in a body known as the International Convention which has held two meetings in London, the last being in 1910. In the intervals between the meetings of this body the administration of the catalogue is directed by the International Council expected to meet in London once in three years and to which each country represented by a regional bureau is requested to send a representative.

Meetings of the International Council were held in 1904, 1907, and in 1909, and a meeting of the International Convention was held in 1910, so that a meeting of the International Council was planned for 1913. This meeting, by a vote of the executive committee, was postponed until 1914, as a number of new plans for the reduction of cost and increasing the efficiency of the catalogue were either just going into effect, or had been in operation but a short time, and it was felt that the later date would give the members of the council a better opportunity to judge their value.

Very respectfully, yours,

LEONARD C. GUNNELL,
Assistant in Charge.

Dr. CHARLES D. WALCOTT,
Secretary of the Smithsonian Institution.

APPENDIX 8.

REPORT ON THE PUBLICATIONS.

SIR: I have the honor to submit the following report on the publications of the Smithsonian Institution and its branches during the year ending June 30, 1913:

The Institution proper published during the year 40 papers in the series of "Smithsonian Miscellaneous Collections," an annual report, and pamphlet copies of 37 papers from the general appendix of the report. The Bureau of American Ethnology published an annual report and 3 bulletins, and the United States National Museum issued 96 miscellaneous papers from the Proceedings, a new bulletin, reprint editions of 2 bulletins, and 9 parts of volumes pertaining to the National Herbarium.

The total number of copies of publications distributed by the Institution proper during the year was 111,283, or 1,052 more than during the previous year. This aggregate includes 600 volumes and memoirs of Smithsonian Contributions to Knowledge, 62,688 volumes and pamphlets of Smithsonian Miscellaneous Collections, 22,401 volumes and pamphlets of the Smithsonian Annual Reports, 8,787 special publications, including volume 3 of the Annals of the Astrophysical Observatory and reports on the Harriman Alaska expedition; 15,070 volumes and pamphlets of the Bureau of American Ethnology publications, 1,646 Annual Reports of the American Historical Association, 8 publications of the United States National Museum, and 83 publications not of the Smithsonian Institution or its branches. The National Museum distributed a total of 71,600 copies of its several publications.

SMITHSONIAN CONTRIBUTIONS TO KNOWLEDGE.

QUARTO.

No publications of this series were issued during the year.

SMITHSONIAN MISCELLANEOUS COLLECTIONS.

OCTAVO.

Of the Miscellaneous Collections, volume 57, 2 papers were published; of volume 58, 1 paper, and title-pages and contents of the vol-

ume; of volume 59, 5 papers; of volume 60, 28 papers; of volume 61, 4 papers; in all, 40 papers. These are as follows:

Volume 57.

- No. 9. New York Potsdam-Hoyt Fauna. By Charles D. Walcott. Published September 14, 1912. 54 p., 13 pls. (Publ. 2136.)
 No. 10. Group terms for lower and upper Cambrian series of formations. By Charles D. Walcott. September 16, 1912. 3 p. (Publ. 2137.)

Volume 58.

- No. 2. Bibliography of the geology and mineralogy of tin. By Frank L. and Eva Hess. July 29, 1912. v, 408 p. (Publ. 1987.)
 Title-pages and contents. December 31, 1912. v p. (Publ. 2160.)

Volume 59.

- No. 11. Expeditions organized and participated in by the Smithsonian Institution in 1910 and 1911. July 17, 1912. 51 p., 1 pl., 56 figs. (Publ. 2087.)
 No. 16. New Rodents from British East Africa. By Edmund Heller. July 5, 1912. 20 p. (Publ. 2094.)
 No. 17. New Diptera from Panama. By J. R. Malloch. July 18, 1912. 8 p. (Publ. 2133.)
 No. 18. New species of landshells from Panama Canal Zone. By William H. Dall. July 27, 1912. 3 p., 2 pls. (Publ. 2134.)
 No. 20. The recognition of Pleistocene faunas. By Oliver P. Hay. August 17, 1912. 16 p., 10 figs. (Publ. 2139.)

Volume 60.

- No. 1. Three new species of Pipunculidæ (Diptera) from Panama. By J. R. Malloch. September 6, 1912. 4 p., 3 figs. (Publ. 2141.)
 No. 2. New mammals from eastern Panama. By E. A. Goldman. September 20, 1912. 18 p. (Publ. 2142.)
 No. 3. Descriptions of new genera, species, and subspecies of birds from Panama, Colombia, and Ecuador. By E. W. Nelson. September 27, 1912. 25 p. (Publ. 2143.)
 No. 4. Rubelzul cotton: A new species of Gossypium from Guatemala. By Frederick L. Lewton. October 21, 1912. 2 p., 2 pls. (Publ. 2144.)
 No. 5. Kokia: A new genus of Hawaiian trees. By Frederick L. Lewton. October 22, 1912. 4 p., 5 pls. (Publ. 2145.)
 No. 6. The cotton of the Hopi Indians: A new species of Gossypium. By Frederick L. Lewton. October 23, 1912. 10 p., 5 pls. (Publ. 2146.)
 No. 7. Descriptions of one hundred and four new species and subspecies of birds from the Barussan Islands and Sumatra. By Harry C. Oberholser. October 26, 1912. 22 p. (Publ. 2147.)
 No. 8. New genera and races of African ungulates. By Edmund Heller. November 2, 1912. 16 p. (Publ. 2148.)
 No. 9. A recent meteorite fall near Holbrook, Navajo County, Arizona. By George P. Merrill. November 21, 1912. 4 p. (Publ. 2149.)
 No. 10. The crinoids of the Natural History Museum at Hamburg. By Austin Hobart Clark. November 7, 1912. 33 p. (Publ. 2150.)

- No. 11. A fossil toothed cetacean from California, representing a new genus and species. By Frederick W. True. November 1, 1912. 7 p., 2 pls. (Publ. 2151.)
- No. 12. New races of insectivores, bats, and lemurs from British East Africa. By Edmund Heller. November 4, 1912. 13 p. (Publ. 2152.)
- No. 13. A study of the salinity of the surface water in the North Pacific Ocean and the adjacent enclosed seas. By Austin Hobart Clark. December 4, 1912. 33 p. (Publ. 2153.)
- No. 14. New mammals from the highlands of Siberia. By N. Hollister. November 29, 1912. 6 p. (Publ. 2157.)
- No. 15. A new subspecies of crossbill from Newfoundland. By A. C. Bent. December 12, 1912. 3 p. (Publ. 2158.)
- No. 16. Remains in Eastern Asia of the race that peopled America. By Aleš Hrdlička. December 31, 1912. 5 p., 3 pls. (Publ. 2159.)
- No. 17. Notes on American species of *Peripatus*, with a list of known forms. By Austin Hobart Clark. January 25, 1913. 5 p. (Publ. 2163.)
- No. 18. Smithsonian pyrheliometry revised. By C. G. Abbot and L. B. Aldrich. February 1, 1913. 7 p. (Publ. 2164.)
- No. 19. Description of a new gazelle from northwestern Mongolia. By N. Hollister. February 8, 1913. 2 p. (Publ. 2165.)
- No. 20. Description of a new African grass-warbler of the genus *Cisticola*. By Edgar A. Mearns. February 14, 1913. 2 p. (Publ. 2166.)
- No. 21. Two new subspecies of birds from the slopes of Mount Pirri, eastern Panama. By E. W. Nelson. February 26, 1913. 2 p. (Publ. 2167.)
- No. 22. Descriptions of new mammals from Panama and Mexico. By E. A. Goldman. February 28, 1913. 20 p. (Publ. 2168.)
- No. 24. Two new mammals from the Siberian Altai. By N. Hollister. March 13, 1913. 3 p. (Publ. 2171.)
- No. 25. Diagnosis of a new beaked whale of the genus *Mesoplodon* from the coast of North Carolina. By Frederick W. True. March 14, 1913. 2 p. (Publ. 2172.)
- No. 26. Notice of the occurrence of a Pleistocene camel north of the Arctic Circle. By James Williams Gidley. March 21, 1913. 2 p. (Publ. 2173.)
- No. 27. An extinct American eland. By James Williams Gidley. March 22, 1913. 3 p., 1 pl. (Publ. 2174.)
- No. 28. A new vole from eastern Mongolia. By Gerrit S. Miller, jr. March 31, 1913. 2 p., 1 pl. (Publ. 2175.)
- No. 29. Volcanoes and climate. By C. G. Abbot and F. E. Fowle. March 28, 1913. 24 p., 3 figs. (Publ. 2176.)

Volume 61.

- No. 2. Description of the skull of an extinct horse, found in central Alaska. By Oliver P. Hay. June 4, 1913. 18 p., 2 pls. (Publ. 2181.)
- No. 3. Report on fresh-water Copepoda from Panama, with descriptions of new species. By C. Dwight Marsh. June 20, 1913. 30 p., 5 pls. (Publ. 2182.)
- No. 4. *Saffordia*, a new genus of ferns from Peru. By William R. Maxon. May 26, 1913. 5 p., 2 pls., 1 fig. (Publ. 2183.)
- No. 5. A new dinosaur from the lance formation of Wyoming. By Charles W. Gilmore. May 24, 1913. 5 p., 5 figs. (Publ. 2184.)

The following papers of the Smithsonian Miscellaneous Collections were in press at the close of the fiscal year:

Volume 57.

- No. 11. Cambrian geology and paleontology. II. New Lower Cambrian subfauna. By Charles D. Walcott. 309-326 p., 50-54 pls. (Publ. 2185.)
 No. 12. Cambrian geology and paleontology. II. Cambrian formations of the Robson Peak district, British Columbia and Alberta, Canada. By Charles D. Walcott. 327-343 p., 55-59 pls. (Publ. 2186.)
 No. 13. Cambrian geology and paleontology. II. Dikelocephalus and other genera of the Dikelocephalinae. By Charles D. Walcott. 345-408 p., 60-70 pls. (Publ. 2187.)

Volume 59.

- No. 19. Early Norse Visits to North America. By William H. Babcock. iii, 213 p., 10 pls. (Publ. 2138.)

Volume 60.

- No. 23. The influence of the atmosphere on our health and comfort in confined and crowded places. By Leonard Hill, Martin Flack, James McIntosh, R. A. Rowlands, and H. B. Walker. Hodgkins Fund. 96 p. (Publ. 2170.)
 No. 30. Explorations and field-work of the Smithsonian Institution in 1912. 76 p., 82 figs. (End of volume.) (Publ. 2178.)

Volume 61.

- No. 1. The White Rhinoceros. By Edmund Heller. 77 p., 31 pls. (Publ. 2180.)

SMITHSONIAN ANNUAL REPORTS.

Report for 1911.

The Annual Report of the Board of Regents for 1911 was received from the Public Printer in completed form in January, 1913.

Annual Report of the Board of Regents of the Smithsonian Institution, showing operations, expenditures, and conditions of the Institution for the year ending June 30, 1911. xii, 688 p., 97 pls. (Publ. 2095.)

Small editions of the following papers, forming the general appendix of the annual report for 1911, were issued in pamphlet form:

- The gyrostatic compass. By H. Marchand. 5 p., 3 pl. (Publ. 2096.)
 Radiotelegraphy. By G. Marconi. 15 p., 1 pl. (Publ. 2097.)
 Multiplex telephony and telegraphy by means of electric waves guided by wires. By George O. Squier. 21 p., 1 pl. (Publ. 2098.)
 Recent experiments with invisible light. By R. W. Wood. 12 p., 6 pls. (Publ. 2099.)
 What electrochemistry is accomplishing. By Joseph W. Richards. 16 p. (Publ. 2100.)
 Ancient and modern views regarding the chemical elements. By William Ramsay. 15 p. (Publ. 2101.)

- The fundamental properties of the elements. By Theodore William Richards. 17 p. (Publ. 2102.)
- The production and identification of artificial precious stones. By Noel Heaton. 18 p., 3 pls. (Publ. 2103.)
- The sterilization of drinking water by ultra-violet radiations. By Jules Courmont. 11 p. (Publ. 2104.)
- The legal time in various countries. By M. Philippot. 8 p. Map. (Publ. 2105.)
- Some recent interesting developments in astronomy. By J. S. Plaskett. 16 p. (Publ. 2106.)
- The age of the earth. By J. Joly. 23 p. (Publ. 2107.)
- International air map and aeronautical marks. By Ch. Lallemand. 8 p. (Publ. 2108.)
- Geologic work of ants in tropical America. By J. C. Branner. 31 p., 1 pl. (Publ. 2109.)
- On the value of the fossil floras of the arctic regions as evidence of geological climates. By A. G. Nathorst. 10 p. (Publ. 2110.)
- Recent advances in our knowledge of the production of light by living organisms. By F. Alex. McDermott. 18 p. (Publ. 2111.)
- Organic evolution; Darwinian and de Vriesian. By N. C. Macnamara. 16 p. (Publ. 2112.)
- Magnalia naturæ; or the greater problems of biology. By D'Arcy Wentworth Thompson. 15 p. (Publ. 2113.)
- A history of certain great horned owls. By Charles R. Keyes. 11 p, 8 pls. (Publ. 2114.)
- The passenger pigeon. By Pehr Kalm (1759) and John James Audubon (1831). 18 p., 1 pl. (Publ. 2115.)
- Note on the iridescent colors of birds and insects. By A. Mallock. 8 p., 3 pls. (Publ. 2116.)
- On the positions assumed by birds in flight. By Bentley Beetham. 7 p., 8 pls. (Publ. 2117.)
- The garden of serpents, Butantan, Brazil. By S. Pozzi. 6 p. (Publ. 2118.)
- Some useful native plants from New Mexico. By Paul C. Standley. 16 p., 13 pls. (Publ. 2119.)
- The tree ferns of North America. By William R. Maxon. 29 p., 15 pls. (Publ. 2120.)
- The value of ancient Mexican manuscripts in the study of the general development of writing. By Alfred M. Tozzer. 14 p., 5 pls. (Publ. 2121.)
- The discoverers of the art of iron manufacture. By W. Belck. 15 p. (Publ. 2122.)
- The Kabyles of north Africa. By A. Lissauer. 16 p., 12 pls. (Publ. 2123.)
- Chinese architecture and its relation to Chinese culture. By Ernst Boerschmann. 29 p., 10 pls. (Publ. 2124.)
- The Lolos of Kientchang, western China. By A. F. Legendre. 18 p., 4 pls. (Publ. 2125.)
- The physiology of sleep. By R. Legendre. 16 p. (Publ. 2126.)
- Profitable and fruitless lines of endeavor in public health work. By Edwin O. Jordan. 8 p. (Publ. 2127.)
- Factory sanitation and efficiency. By C.-E. A. Winslow. 6 p. (Publ. 2128.)
- The physiological influence of ozone. By Leonard Hill and Martin Flack. 12 p. (Publ. 2129.)
- Traveling at high speeds on the surface of the earth and above it. By H. S. Hele-Shaw. 21 p. (Publ. 2130.)

Robert Koch, 1843-1910. By C. J. M. 8 p., 1 pl. (Publ. 2131.)

Sir Joseph Dalton Hooker, 1817-1911. By Lieut. Col. D. Prain. 13 p., 1 pl. (Publ. 2132.)

Report for 1912.

The report of the executive committee and proceedings of the Board of Regents of the Institution, as well as the report of the Secretary for the fiscal year ending June 30, 1912, both forming part of the annual report of the Board of Regents to Congress, were published in pamphlet form in December, 1912, as follows:

Report of the executive committee and Proceedings of the Board of Regents for the year ending June 30, 1912. 22 pp. (Publ. 2155.)

Report of the secretary of the Smithsonian Institution for the year ending June 30, 1912. iii, 110 p., 2 pl. (Publ. 2156.)

The general appendix to the Smithsonian Report for 1912 was in type, but actual presswork was not completed at the close of the fiscal year. In the general appendix are the following papers:

The year's progress in astronomy, by P. Puiseux.

The spiral nebulae, by P. Puiseux.

The radiation of the sun, by C. G. Abbot.

Molecular theories and mathematics, by Émile Borel.

Modern mathematical research, by G. A. Miller.

The connection between the ether and matter, by Henri Poincaré.

Experiments with soap bubbles, by C. V. Boys.

Measurements of infinitesimal quantities of substances, by William Ramsay.

The latest achievements and problems of the chemical industry, by Carl Duisberg.

Holes in the air, by W. J. Humphreys.

Review of applied mechanics, by L. Lecornu.

Report on the recent great eruption of the volcano "Stromboli," by Frank A. Perret.

The glacial and postglacial lakes of the Great Lakes region, by Frank B. Taylor.

Applied geology, by Alfred H. Brooks.

The relations of paleobotany to geology, by F. H. Knowlton.

Geophysical research, by Arthur L. Day.

A trip to Madagascar, the country of beryls, by A. Lacroix.

The fluctuating climate of North America, by Ellsworth Huntington.

The survival of organs and the "culture" of living tissues, by R. Legendre.

Adaptation and inheritance in the light of modern experimental investigation, by Paul Kammerer.

The paleogeographical relations of antarctica, by Charles Hedley.

The ants and their guests, by P. E. Wasmann.

The penguins of the antarctic regions, by L. Gain.

The derivation of the European domestic animals, by C. Keller.

Life: its nature, origin, and maintenance, by E. A. Schäfer.

The origin of life: a chemist's fantasy, by H. E. Armstrong.

The appearance of life on worlds and the hypothesis of Arrhénius, by Alphonse Berget.

The evolution of man, by G. Elliot Smith.

The history and varieties of human speech, by Edward Sapir.

Ancient Greece and its slave population, by S. Zaborowski.

Origin and evolution of the blond Europeans, by Adolphe Bloch.

History of the finger-print system, by Berthold Laufer.

Urbanism: A historic, geographic, and economic study, by Pierre Clerget.

The Sinai problem, by E. Oberhummer.

The music of primitive peoples and the beginnings of European music, by Willy Pastor.

Expedition to the South Pole, by Roald Amundsen.

Icebergs and their location in navigation, by Howard T. Barnes.

Henri Poincaré, his scientific work, his philosophy, by Charles Nordmann.

SPECIAL PUBLICATIONS.

The following special publications were issued in octavo form:

Publication lists.

Classified list of Smithsonian publications available for distribution January 1, 1913. Published February 25, 1913. vi, 31 p. (Publ. 2161.)

Publications of the Smithsonian Institution issued between January 1 and July 1, 1912. July 19, 1912. 2 p. (Publ. 2135.)

Publications of the Smithsonian Institution issued between January 1 and October 1, 1912. October 28, 1912. 3 p. (Publ. 2154.)

Publications of the Smithsonian Institution issued between January 1 and December 31, 1912. February 1, 1913. 5 p. (Publ. 2162.)

Publications of the Smithsonian Institution issued between January 1 and March 31, 1913. April 10, 1913. 1 p. (Publ. 2179.)

Zoological nomenclature.

Opinions rendered by the International Commission on Zoological Nomenclature, Opinions 52-56. May 10, 1913. 12 p. (Publ. 2169.)

The following special publication was in press at the close of the fiscal year:

Harriman Alaska series.

Vol. 14. Monograph of Shallow-water Starfishes of the North Pacific Coast from the Arctic Ocean to California. By Addison Emery Verrill. xii, 338 p., 110 pl. (Publ. 2140.)

PUBLICATIONS OF THE UNITED STATES NATIONAL MUSEUM.

The publications of the National Museum are: (*a*) The annual report to Congress; (*b*) the proceedings of the United States National Museum, and (*c*) the bulletin of the United States National Museum, which includes the contributions from the United States National Herbarium. The editorship of these publications is vested in Dr. Marcus Benjamin.

The publications issued by the National Museum during the year comprised 96 papers of the Proceedings, 2 bulletins, and 9 parts of Contributions from the National Herbarium.

The issues of Proceedings were as follows: Vol. 42, papers 1907 to 1922, inclusive; Vol. 43, papers 1923 to 1945, inclusive; Vol. 44, papers 1946 to 1975, inclusive; Vol. 45, papers 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, and 2004; a total of 96 papers.

The bulletins were as follows:

Bulletin 79. List of North American Land Mammals in the United States National Museum, 1911. By Gerrit S. Miller, jr.

Bulletin 81. Synopsis of the Rotatoria. By Harry K. Harring.

In the series of Contributions from the National Herbarium (octavo) there appeared:

Volume 16.

Part 3. The North American species of Nymphaea. By Gerrit S. Miller, jr., and Paul C. Standley.

Part 4. Descriptions of new plants preliminary to a report upon the flora of New Mexico. By E. O. Wootton and Paul C. Standley.

Part 5. Miscellaneous Papers. By C. V. Piper, J. N. Rose, Paul C. Standley, W. E. Safford, and E. S. Steele.

Part 6. Three new genera of stilt palms (Iriarteaceæ) from Colombia, with a synoptical review of the family. By O. F. Cook and C. B. Doyle.

Part 7. Studies in Cactaceæ. Part 1. By N. L. Britton and J. N. Rose.

Part 8. Relationships of the false date palm of the Florida Keys, with a synoptical key to the families of American palms. By O. F. Cook.

Part 9. The genus Epiphyllum and its allies. By N. L. Britton and J. N. Rose.

Volume 17.

Part 1. The lichen flora of southern California. By Hermann Edward Hasse.

Part 2. Studies of tropical American ferns. No. 4. By William R. Maxon.

There was also reprinted an edition of 500 copies of Bulletin 71, Part 2, A monograph of the Foraminifera of the North Pacific Ocean. Part II. Textulariidae, by Joseph A. Cushman; and an edition of 100 reprints of Bulletin 79, List of North American Land Mammals in the United States National Museum, 1911, by Gerrit S. Miller, jr.

Among the National Museum publications in press at the close of the year were: Bulletin 80, A descriptive account of the building recently erected for the departments of natural history of the United States National Museum, by Richard Rathbun. 131 p., 34 pl., and the annual report for 1912.

PUBLICATIONS OF THE BUREAU OF AMERICAN ETHNOLOGY.

The publications of the bureau are discussed elsewhere in the Secretary's report. The editorial work is in the charge of Mr. J. G. Gurley.

One annual report and two new bulletins, together with a partially revised edition of a third bulletin, were issued during the year, as follows:

Twenty-eighth Annual Report, containing ("Accompanying Papers," as follows:

- (1) Casa Grande, by Jesse Walter Fewkes;
- (2) Antiquities of the Upper Verde River and Walnut Creek Valleys, Arizona, by Jesse Walter Fewkes;
- (3) Preliminary Report on the Linguistic Classification of Algonquian Tribes, by Truman Michelson.)

Bulletin 30. Handbook of American Indians North of Mexico, edited by Frederick Webb Hodge. [By concurrent resolution of Congress in August, 1912, a reprint of this bulletin was ordered in an edition of 6,500 copies, of which 4,000 were for the use of the House of Representatives, 2,000 for the use of the Senate, and 500 for the use of the bureau. This reprint, in which were incorporated such desirable alterations as could be conveniently made without affecting the pagination of the work, was issued in January, 1913.]

Bulletin 52. Early Man in South America. By Aleš Hrdlička in collaboration with William H. Holmes, Bailey Willis, Fred. Eugene Wright, and Clarence N. Fenner.

Bulletin 54. The Physiography of the Rio Grande Valley, New Mexico, in Relation to Pueblo Culture. By Edgar Lee Hewett, Junius Henderson, and Wilfred William Robbins.

The Twenty-ninth Annual Report ("Accompanying Paper," The Ethnogeography of the Tewa Indians, by John Peabody Harrington) was in press at the close of the year.

PUBLICATIONS OF THE SMITHSONIAN ASTROPHYSICAL OBSERVATORY.

Volume III of the Annals of the Smithsonian Astrophysical Observatory was printed and nearly ready for distribution at the close of the fiscal year.

PUBLICATIONS OF THE AMERICAN HISTORICAL ASSOCIATION.

The annual reports of the American Historical Association are transmitted by the association to the Secretary of the Smithsonian Institution, and are communicated to Congress under the provisions of the act of incorporation of the association.

The annual report for 1910 was published October 22, 1912, with contents as follows:

Report of the proceedings of the twenty-sixth annual meeting of the American Historical Association. By Waldo G. Leland, secretary.

Report of the proceedings of the seventh annual meeting of the Pacific coast branch. By Jacob N. Bowman, secretary of the branch.

The efforts of the Danish Kings to secure the English crown after the death of Harthacnut. By Laurence M. Larson.

The records of the privy seal. By James F. Baldwin.

Royal purveyance in fourteenth-century England in the light of Simon Islip's Speculum Regis. By Chalfant Robinson.

Anglo-Dutch relations, 1654-1660. By Ralph C. H. Catterall.

- Some critical notes on the works of S. R. Gardiner. By Roland G. Usher.
- The Mexican policy of southern leaders under Buchanan's administration. By James Morton Callahan.
- The decision of the Ohio Valley. By Carl Russell Fish.
- North Carolina on the eve of secession. By William K. Boyd.
- The inception of the Montgomery convention. By Armand J. Gerson.
- The attitude of Congress toward the Pacific Railway, 1856-1862. By Allen Marshall Kline.
- The work of the Western State Historical Society, as illustrated by Nevada. By Jeanne E. Wier.
- Proceedings of the seventh annual conference of historical societies.
- The study of history in secondary schools. Report of the Committee of Five.
- Eleventh annual report of the public archives commission. By Herman V. Ames, chairman.
- Appendix A. Proceedings of the second annual conference of archivists.
- Appendix B. Report on the archives of the State of Indiana. By Harlow Lindley.
- Appendix C. Report on the archives of the State of Kentucky. By Irene T. Myers.
- Appendix D. Report on the archives of the State of Nebraska. By Addison E. Sheldon.
- Appendix E. Notes on the archives of the Philippines. By James A. Robertson.
- Writings on American History, 1910. By Grace G. Griffin.

The report for 1911, in two volumes, was sent to the printer on January 9, 1913, and at the close of the year was nearly ready for distribution. The contents are as follows:

Volume I.

- Report of the proceedings of the twenty-seventh annual meeting of the American Historical Association. By Waldo G. Leland, secretary.
- Report of the proceedings of the eighth annual meeting of the Pacific coast branch. By H. W. Edwards, secretary of the branch.
- The archives of the Venetian Republic. By Theodore F. Jones.
- Materials for the history of Germany in the sixteenth and seventeenth centuries. By Sidney B. Fay.
- The materials for the study of the English cabinet in the eighteenth century. By Edward Raymond Turner.
- François de Guise and the taking of Calais. By Paul van Dyke.
- Factions in the English privy council under Elizabeth. By Conyers Read.
- Anglo-Dutch relations, 1671-1672. By Edwin W. Pahlow.
- American-Japanese intercourse prior to the advent of Perry. By Inazo Nitobe.
- Colonial society in America. By Bernard Moses.
- French diplomacy and American politics, 1794-1795. By James Alton James.
- The insurgents of 1811. By D. R. Anderson.
- The tariff and the public lands from 1828 to 1833. By Raynor G. Wellington.
- The "Bargain of 1844" as the origin of the Wilmot proviso. By Clark E. Persinger.
- Monroe and the early Mexican revolutionary agents. By Isaac Joslin Cox.
- Public opinion in Texas preceding the Revolution. By Eugene C. Barker.
- Relations of America with Spanish America, 1720-1744. By H. W. V. Temperley.
- The genesis of the Confederation of Canada. By Cephas D. Allin.

Proceedings of the eighth annual conference of historical societies.

List of European historical societies.

Twelfth report of the public archives commission. By Herman V. Ames, chairman.

Appendix A. Proceedings of the third annual conference of archivists.

Appendix B. Report on the archives of the State of Colorado. By James F. Willard.

Appendix C. List of commissions and instructions to governors and lieutenant governors of American and West Indian Colonies, 1609-1784.

Writings on American history, 1911. By Grace G. Griffin.

Volume II.

Ninth report of the historical manuscripts commission: Correspondence of Alexander Stephens, Howell Cobb, and Robert Toombs.

PUBLICATIONS OF THE SOCIETY OF THE DAUGHTERS OF THE AMERICAN REVOLUTION.

The manuscript of the Fifteenth Annual Report of the National Society of the Daughters of the American Revolution for the year ending October 11, 1912, was communicated to Congress March 19, 1913.

THE SMITHSONIAN ADVISORY COMMITTEE ON PRINTING AND PUBLICATION.

The editor has continued to serve as secretary of the Smithsonian advisory committee on printing and publication. To this committee have been referred the manuscripts proposed for publication by the various branches of the Institution, as well as those offered for printing in the Smithsonian publications. The committee also considered forms of routine, blanks, and various matters pertaining to printing and publication, including the qualities of paper suitable for text and plates. Twenty-two meetings were held and 138 manuscripts were acted upon.

Respectfully submitted.

A. HOWARD CLARK, *Editor.*

DR. CHARLES D. WALCOTT,

Secretary of the Smithsonian Institution.

APPENDIX 9.

HODGKINS FUND.

ADVISORY COMMITTEE ON THE LANGLEY AERODYNAMICAL LABORATORY.¹

OFFICIAL STATUS.

Authorization.—On May 1, 1913, the Regents of the Smithsonian Institution, approving a general scheme submitted by Secretary Walcott, authorized the secretary, with the approval of the executive committee, to reopen the Langley Aerodynamical Laboratory; to appoint an advisory committee; to add, as means are provided, other laboratories and agencies; to group them into a bureau organization; and to secure the cooperation with them of the Government and other agencies.

Functions.—The committee is to advise as to the organization and work of the Langley Aerodynamical Laboratory and of the bureau organization when adopted, and the coordination of their activities with the kindred labors of other establishments, governmental and private; it is to plan for such theoretical and experimental investigations, tests, and reports as may serve to increase the safety and effectiveness of aerial locomotion for the purposes of commerce, national defense, and the welfare of man. But neither the committee nor the Smithsonian Institution will promote patented devices, furnish capital to inventors, or manufacture commercially, or give regular courses of instruction for aeronautical pilots or engineers.

The organization, under regulations to be established and fees to be fixed by the secretary, approved by the Smithsonian executive committee, may exercise its functions for the military and civil departments of the Government of the United States, and also for any individual, firm, association, or corporation within the United States; provided, however, that such department, individual, firm, association, or corporation shall defray the cost of all material used and of all services of persons employed in the exercise of such functions.

With the approval of the Secretary of the Institution, the committee is to collect aeronautical information, such part of the same as may be valuable to the Government, or the public, to be issued in bulletins and other publications.

¹Reprinted from Smithsonian Miscellaneous Collections, vol. 62, No. 1, 1913.

Membership and Privileges.—The advisory committee is to be composed of the director of the Langley Aerodynamical Laboratory, when appointed, and one member to be designated by the Secretary of War, one by the Secretary of the Navy, one by the Secretary of Agriculture, and one by the Secretary of Commerce, together with such other persons, to be designated by the Secretary of the Smithsonian Institution, as may be acquainted with the needs of aeronautics, the total membership of such committee not to exceed 14.

The members of the advisory committee, as such, are to serve without compensation, but will have refunded the necessary expenses incurred by them in going to Washington to attend the meetings of the committee and returning therefrom, and while attending the meetings.

Approval of the President.—On May 9, 1913, the President of the United States, by request of the Secretary of the Smithsonian Institution, approved the designation of representatives of the above-named departments to serve on the advisory committee.

ORGANIZATION.

Officers.—The advisory committee, as constituted at its organization meeting, convened by Secretary Walcott at the Smithsonian Institution, May 23, 1913, comprises a chairman, a recorder, and 12 additional members, all of whom are to serve for one year. The officers are to be elected annually on or about May 6, and the members for the ensuing year are to be appointed prior to the date of such election.

The chairman has general supervision of the work of the advisory committee, presides at its meetings, receives the reports of the subcommittees, and makes an annual report to the Secretary of the Smithsonian Institution. Said report must include an account of the work done for any department of the Government, individual, firm, association, or corporation, and the amounts paid by them to defray the cost of material and services, as hereinbefore mentioned.

The recorder keeps the minutes of the meetings of the committee and assists the chairman in conducting correspondence and preparing reports pertaining to the business of the committee.

Subcommittees.—The chairman, with the approval of the advisory committee, may appoint standing and special subcommittees to perform such functions as may be assigned to them.

The standing subcommittees may have assigned to them investigations and tests of a permanent character, which they may prosecute from year to year and on which they are to make quarterly reports to the chairman, followed by an annual report. Each subcommittee comprises a chairman, who must be a member of the advisory committee, and others, chosen by him from that committee or elsewhere.

AGENCIES, RESOURCES, AND FACILITIES.

Smithsonian Institution.—The advisory committee has been provided by the Smithsonian Institution with suitable office headquarters, an administrative and accounting system, library and publication facilities, lecture and assembly rooms, and museum space for aeronautic models. The Langley Aerodynamical Laboratory has an income provided for it not to exceed \$10,000 the first year (of which \$5,000 has been allotted), and \$5,000 annually for five years.

United States Bureau of Standards.—For the exact determination of aerophysical constants, the calibration of instruments, the testing of aeronautic engines, propellers, and materials of construction, the committee has the cooperation of the United States Bureau of Standards, from which the Secretary of Commerce has designated one representative.

This bureau has a complete equipment for studying the mechanics of materials and structural forms used in air-craft; for standardizing the physical instruments—thermometers, barographs, pressure gauges, etc.—used in air navigation; and for testing the power, efficiency, etc., of aeronautical motors in a current of air representing the natural conditions of flight.

In these general branches the technical staff of the bureau is prepared to undertake such theoretical and experimental investigations as may come before the advisory committee on behalf of either the Government or private individuals or organizations.

United States Weather Bureau.—For studies of and reports on every phase of aeronautic meteorology, besides the usual forecasting, the committee has the cooperation of the United States Weather Bureau, from which the Secretary of Agriculture has designated one representative.

This bureau has an extensive library of works on or allied to aeronautics, an instrument division for every type of apparatus for studying the state of the atmosphere, a whirling table of 30-foot radius for standardizing anemometers, a complete kite equipment with power reel, and a sounding balloon equipment with electrolytic hydrogen plant, all of which are available for scientific investigations. For special forecasts, anticipating field tests or cross-country voyages, the general service of the bureau may be called upon.

War and Navy Departments.—These departments, while especially interested in aeronautics for national defense, can be of service in advancing the general science. Each has an aeronautical library; each has an official representative in foreign countries who reports periodically on every important phase of the art, whether civil or military; each has an assignment of officers who design, test, and operate air craft, and who determine largely the scope and character

of their development; each has its aeronautic station equipped with machines in actual service throughout the year. Besides various aviation establishments, the War Department has a balloon plant at Fort Myer, Va., and at Omaha, Nebr.; the Navy has its marine model basin, useful for special experiments in aeronautics, its extensive shops at the Washington Navy Yard, available for the alteration or repair of air craft or the manufacture of improved military types, and at Fort Myer three lofty open-work steel towers suitable for studies in meteorology or aerodynamics in the natural wind. Furthermore, the Navy Department has detailed an officer for special research in aeronautics at one of the principal engineering schools.

Because of their fundamental interest in aeronautics, each of these departments has two representatives on the advisory committee, and each will be able to place at the service of the committee one or more skilled aviators and aeroplanes for systematic experimentation.

PRESENT NEEDS.

In presenting the needs of the organization, it is well to remark that the Smithsonian Institution possesses the unique character of being a private organization having governmental functions and prerogatives. It can receive appropriations directly from Congress; it can be the recipient or the custodian of private funds for the increase and diffusion of knowledge; it can deposit such private funds with the United States Treasury, or place them otherwise, as may be required by the donor. Likewise, it can be the recipient or custodian of material objects representing any province of nature or any branch of human knowledge or art. This unique character allows the public to anticipate or supplement the cooperation of Congress in promoting the aerodromical (aeronautical) work of the Institution.

Endowment funds.—Persons approving the purpose of the organization and desiring its continuity and permanence can not do better than to provide for it a steady income, either for general or for specific use. Individual endowment funds bearing the name of the giver or other person, and presented to the Smithsonian Institution, or placed in its custody at the disposal of the committee, may be recommended; also collective funds bearing the name of a society, organization, or section of the country, whether in the interest of scientific progress or of national defense.

Temporary funds.—For the prompt achievement of definite results, funds may well be offered for immediate application, both of principal and interest; as, for example, for the erection of laboratories or other buildings; for the purchase of experimental air craft, or apparatus, instruments, etc.

Most needed is an expansion of the Langley Aerodynamical Laboratory providing a large and a small wind tunnel, ampler shops, and

instrument and model rooms. Adjacent to this, or forming a part of it, may well be the headquarters of the committee, with the collections of aeronautic publications and exhibits, and with designing rooms where plans for air craft may be matured by fabricators in consultation with the technical staff. This new building, if placed on the Smithsonian grounds, should be of good architecture and cost not less than \$100,000.

Of immediate importance is an air-craft field laboratory, adjacent to ample flying space of land and water, and adapted to assembling, adjusting, and repairing several full-scale land and water aeroplanes, and subjecting them to indoor tests and measurements, as of stress, strain, factor of safety, center of gravity, moment of inertia, working condition, etc. One such plant suitably located would serve all governmental and civilian requirements for the present. A suitable site is the public land in Potomac Park in the vicinity of the Smithsonian Institution. Here might be held air-craft competitions under the auspices of the Government.

Prizes and awards.—As a stimulus to the highest aeronautic achievement, or as an honorable recognition thereof, suitable prizes or awards might advantageously be offered. Provision should be made for liberal cash prizes for competitive tests of motors, propellers, etc., in a purely scientific way not trenching upon the province of aero clubs.

Fellowships.—For the prosecution of special aeronautic investigations in cooperation with the advisory committee, educational institutions and scientific or engineering organizations should be provided with research fellowships whose incumbents may have the counsel of the committee and the advantage of its equipments.

Until adequate appropriations have been made by the Government the activities of the organization and committee will have to be sustained largely by private resources.



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